Modeling and Simulation in Testing & Training:

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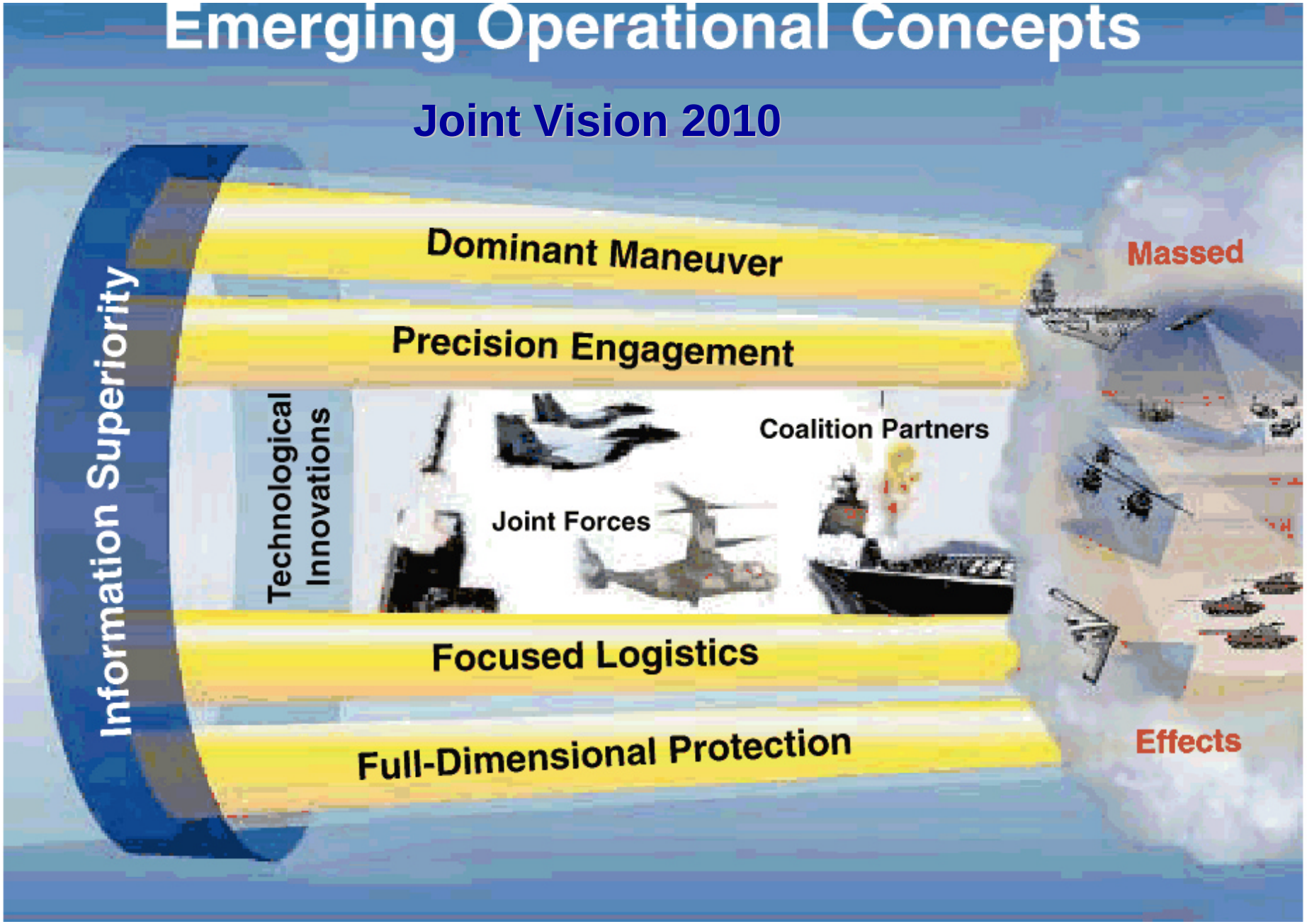
15 August 2001

M&S in Testing & Training

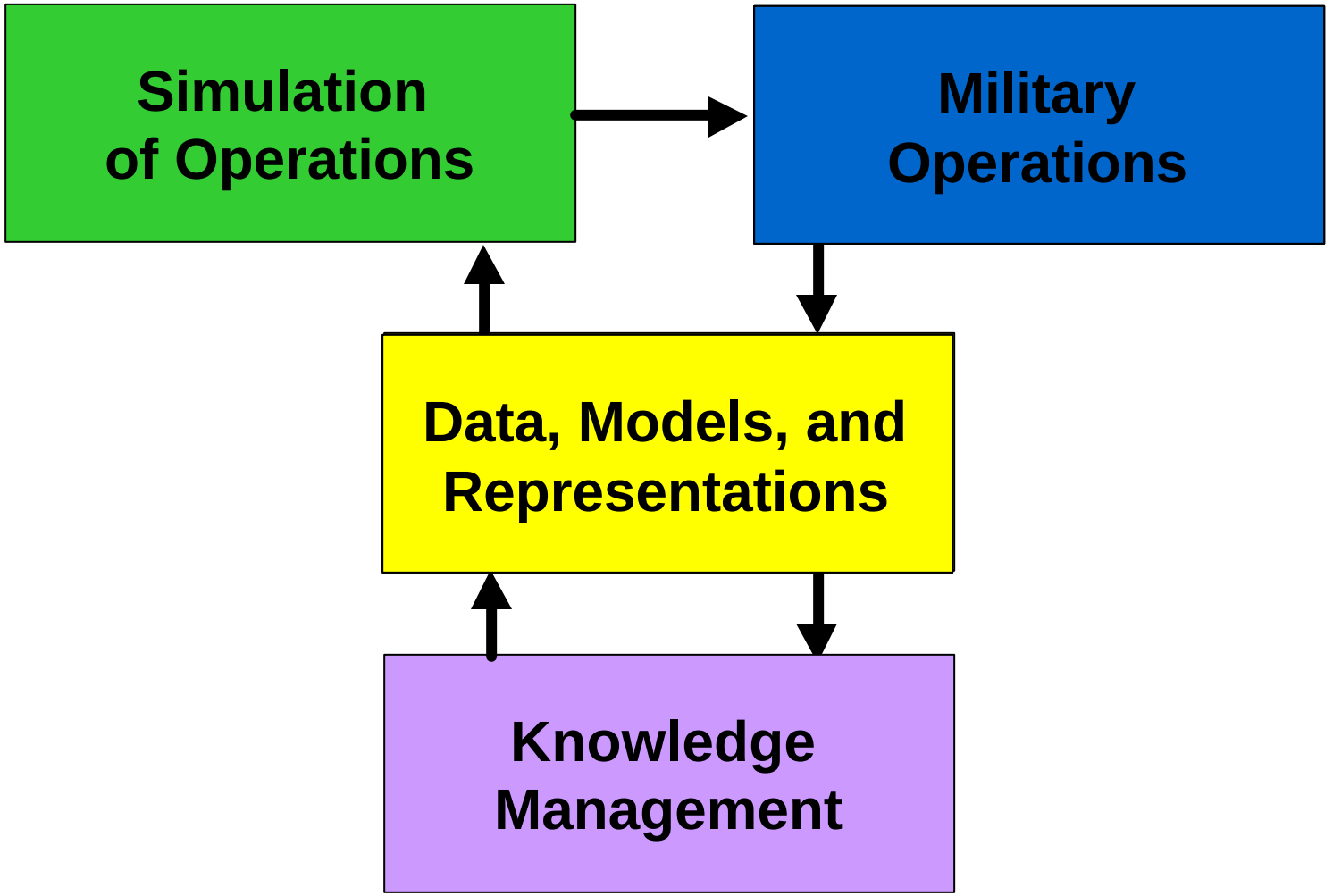
- Framing the Question
- The Military Domain Representation Framework
- Non-Military Example
- Military Operations in Urban Terrain Example

Emerging Operational Concepts

Joint Vision 2010



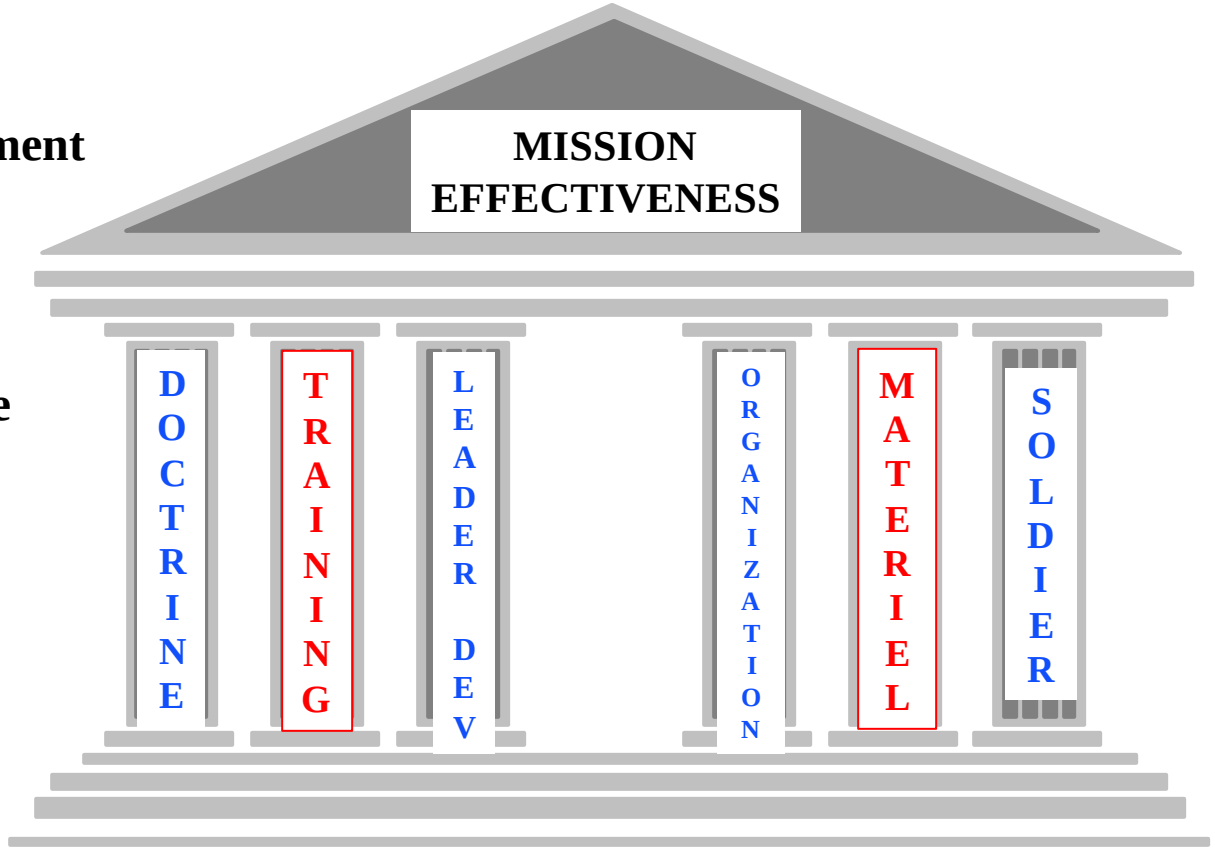
Information-Intensive Warfare, Digitization of the Battle blurs distinctions between simulations and operations



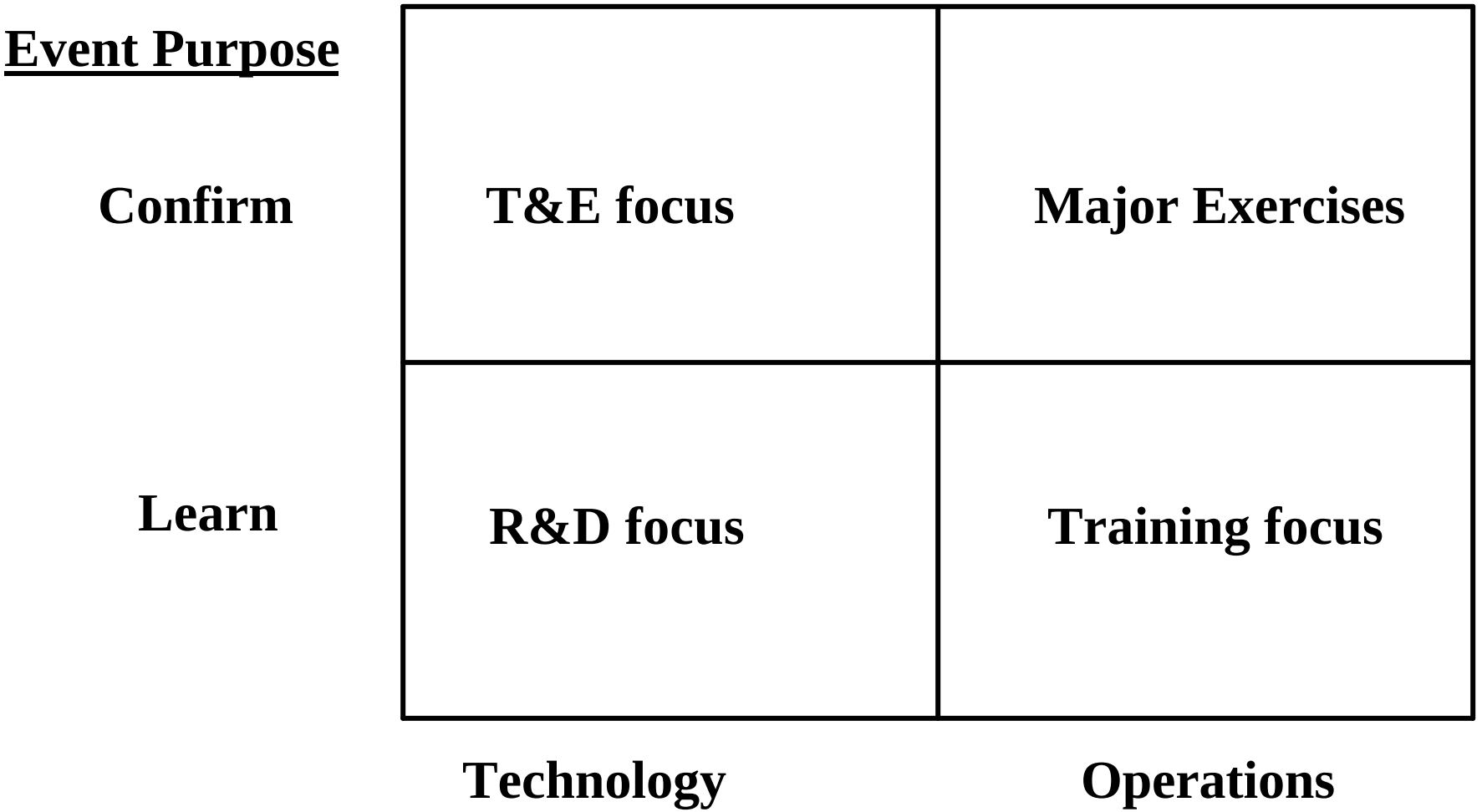
Testing & Training within DTLOMS

The elements of DTLOMS are:

- **Doctrine**
- **Training**
- **Leader Development**
- **Organization**
- **Materiel**
- **Soldier Structure**



Complimentary and Competing Purpose and Content



Perspectives

- The Warfighter cares about Credibilty.
- The Developer cares about Completeness.
- The Program Manager cares about Cost.

Achieving all three requires a focus on Composability

Communicating Mission Space Knowledge: One Way

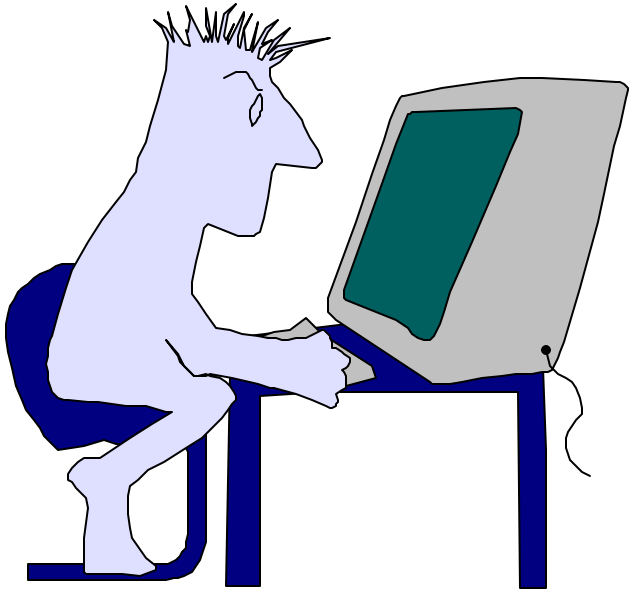
- Warfighter: FO calls in mission. FA Btty fires it.
- Developer: What's an FO?

- Warfighter : Forward Observer -- the guy with the grunts that has a DMD.
- Developer: What's a DMD?

- Warfighter : Digital Message Device -- the FO uses it to send in Fire Requests to the FIST.
- Developer: What's a FIST?

Ambiguity is an Issue

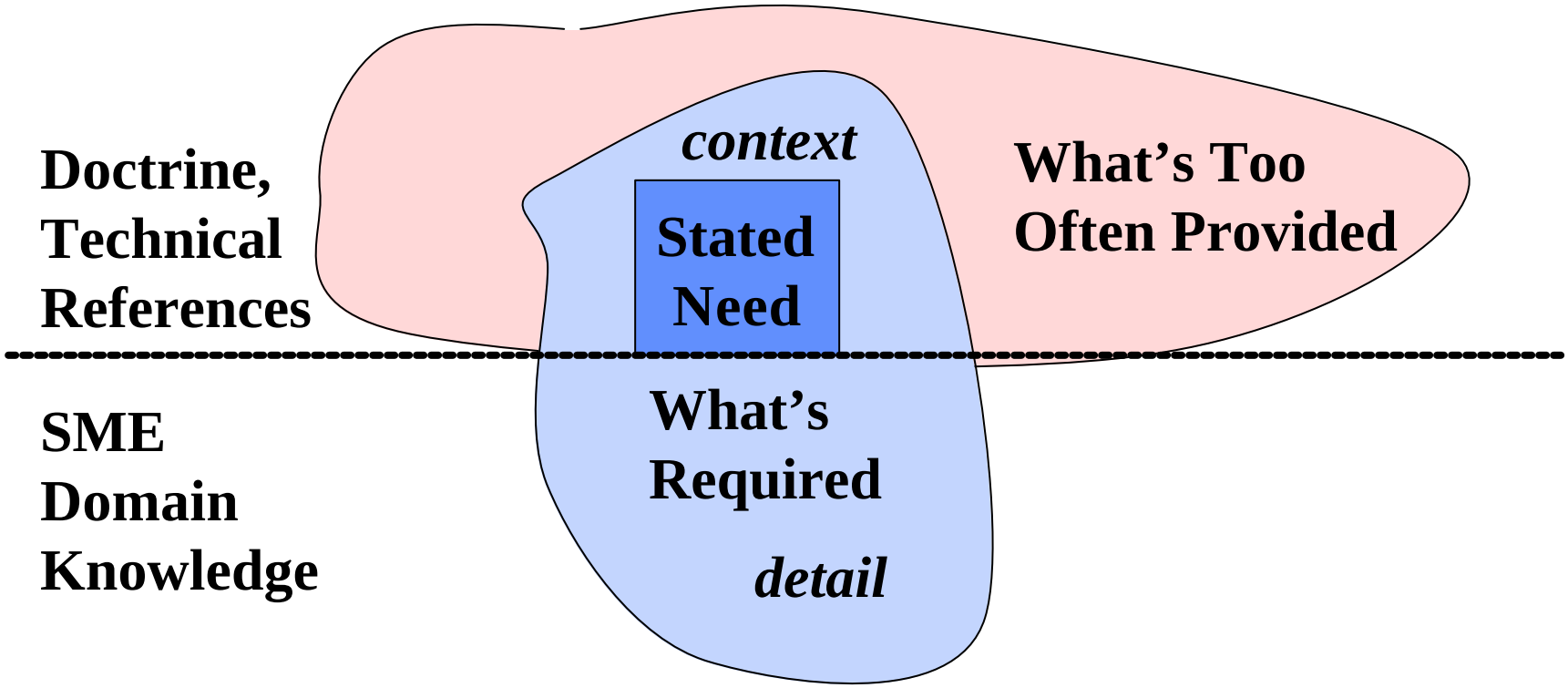
FO calls in mission.
FA Btty fires it.



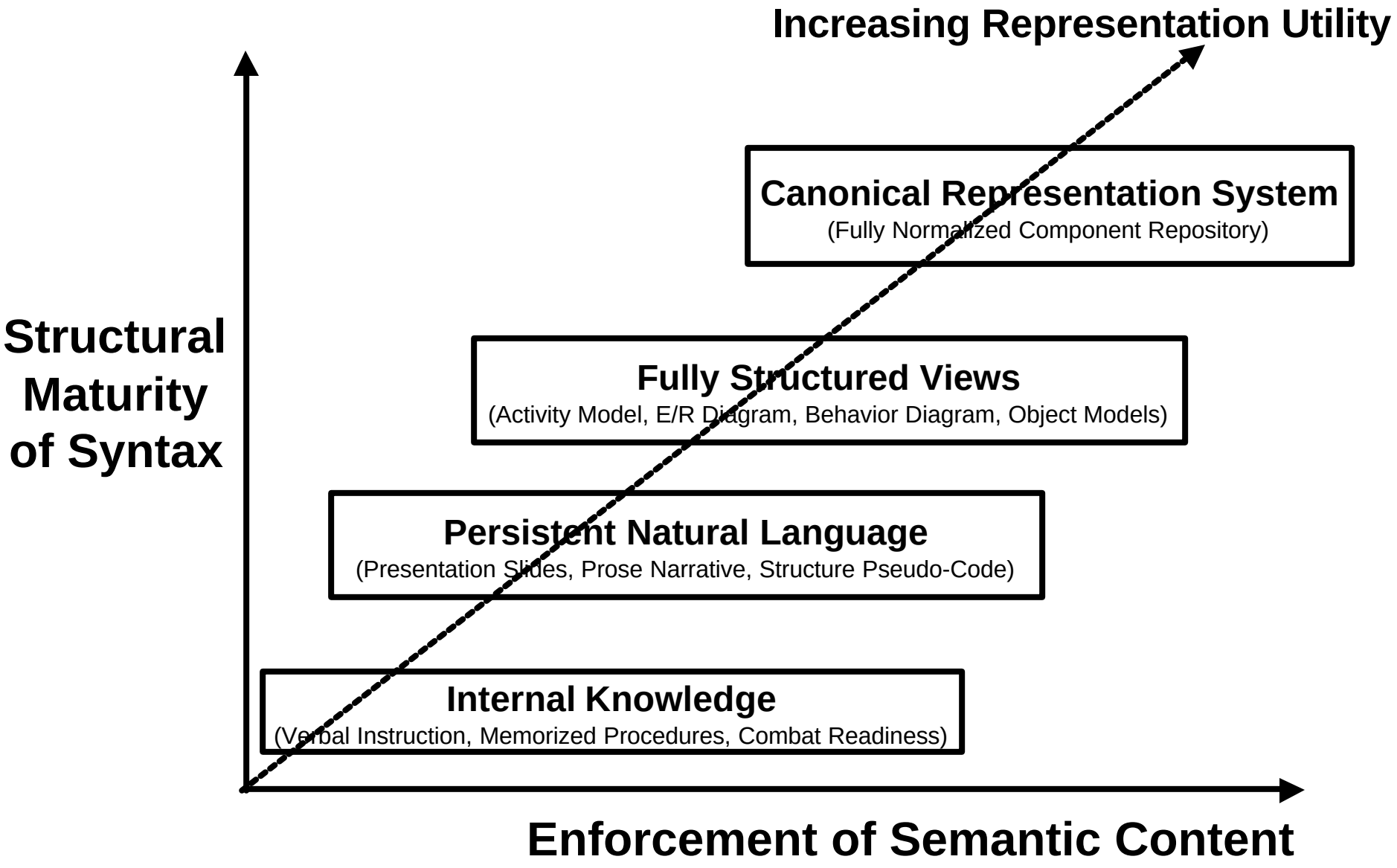
Is he calling the priest to warn him that he's going to set the mission on fire?

But why is the church burning?

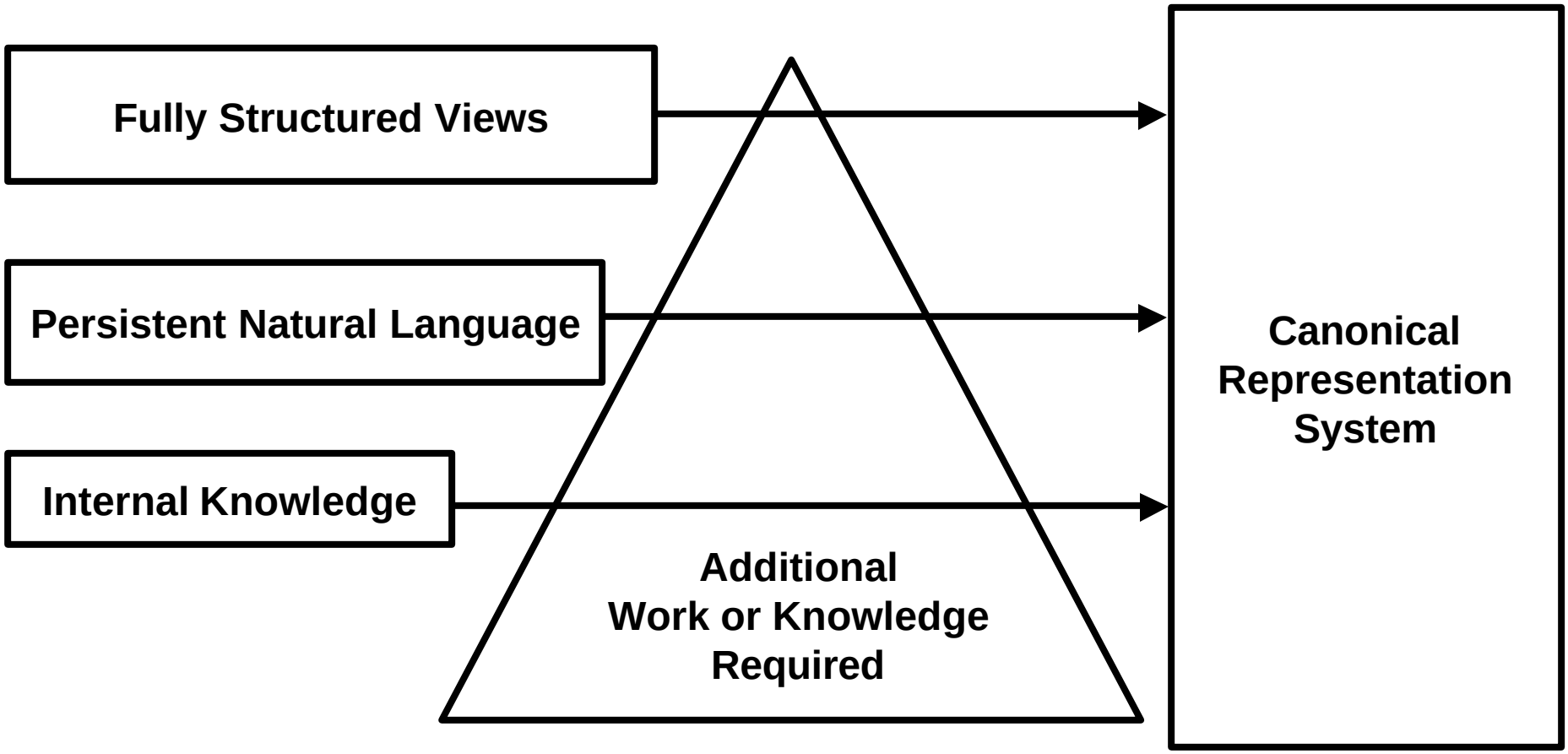
Available Information: Too Much and Too Little



Domain Representation Dimensions



Migrating Mission Space Models at Multiple Levels of Structural Maturity



M&S in Testing & Training

- Framing the Question
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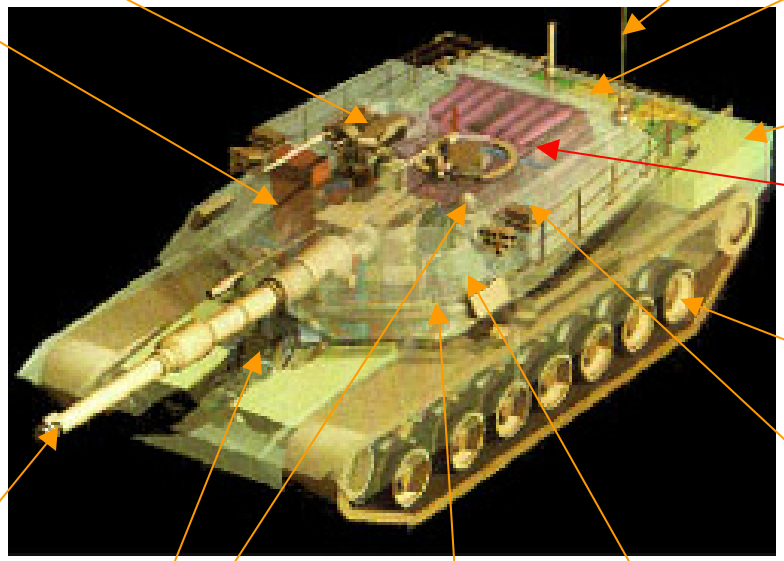
The Military Domain Representation Framework: is an initiative by LFT&E, AMSAA, and DMSO to integrate

- the Vulnerability/Lethality Taxonomy (AMSAA, DOT&E,...)
  - **Mission Utility, System Performance, System Components, Interactions**
- the Functional Description of the Mission Space (DMSO, TRADOC,...)
  - **Processes, Entities, Relationships, Interactions**
  - **FDMS (formerly CMMS) Data Interchange Format (DIF)**
  - **Role-Based Data Engineering Process**
  - **Integration with TRADOC Functional Description of the Battlespace (FBD)**
- the C4ISR Architecture Framework (ASD/C3I, Joint Staff,...)
  - **Operational Architecture, Systems Architecture, Technical Architecture**
  - **C4ISR Architecture Data Model (CADM)**
- the Concise Theory of Combat (NPS, TMCI,...)
  - **Combat Processes, Combat Interactions, Tactical Deterrence**
- the Integrated Natural Environment (DMSO, NIMA, AFCCC, NAVO...)
  - **Terrain, Oceanography, Air and Space Weather**

Into a general methodology for analyzing weapon systems effectiveness

Example: Platform Configuration

Level 2]



Secondary Armament

Early Warning Sensors (LWR, RWR, MWR)

Move

Shoot

Communicate

Commo Equipment

Engine Compartment

Fuel

Ammo Compartment

Wheels/Track

Commo Equipment

Target Acquisition/Engagement Sights

Main Armament

Crew

Millimeter Wave Radar Antenna

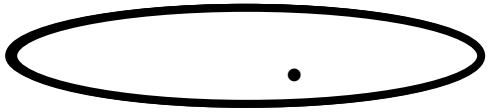
Abstraction: Platform Configuration

Level 2]

Military Operations Context

- **Tactics**
- **Doctrine**
- **Scenario**
- **etc. (Global Variables)**

Level 2]



$v_2[C_1, C_2, \ldots, C_c, C_d, \ldots, C_i, C_k, \ldots, C_m, C_n]$

Crew Ammo Fuel Msn Crit

Re-Armed and Re-Fueled

H + 7

Testing for Platform Capabilities

Level 3]

Move

Communicate

Sense

Engage

Replenish

Abstraction: Platform Capabilities

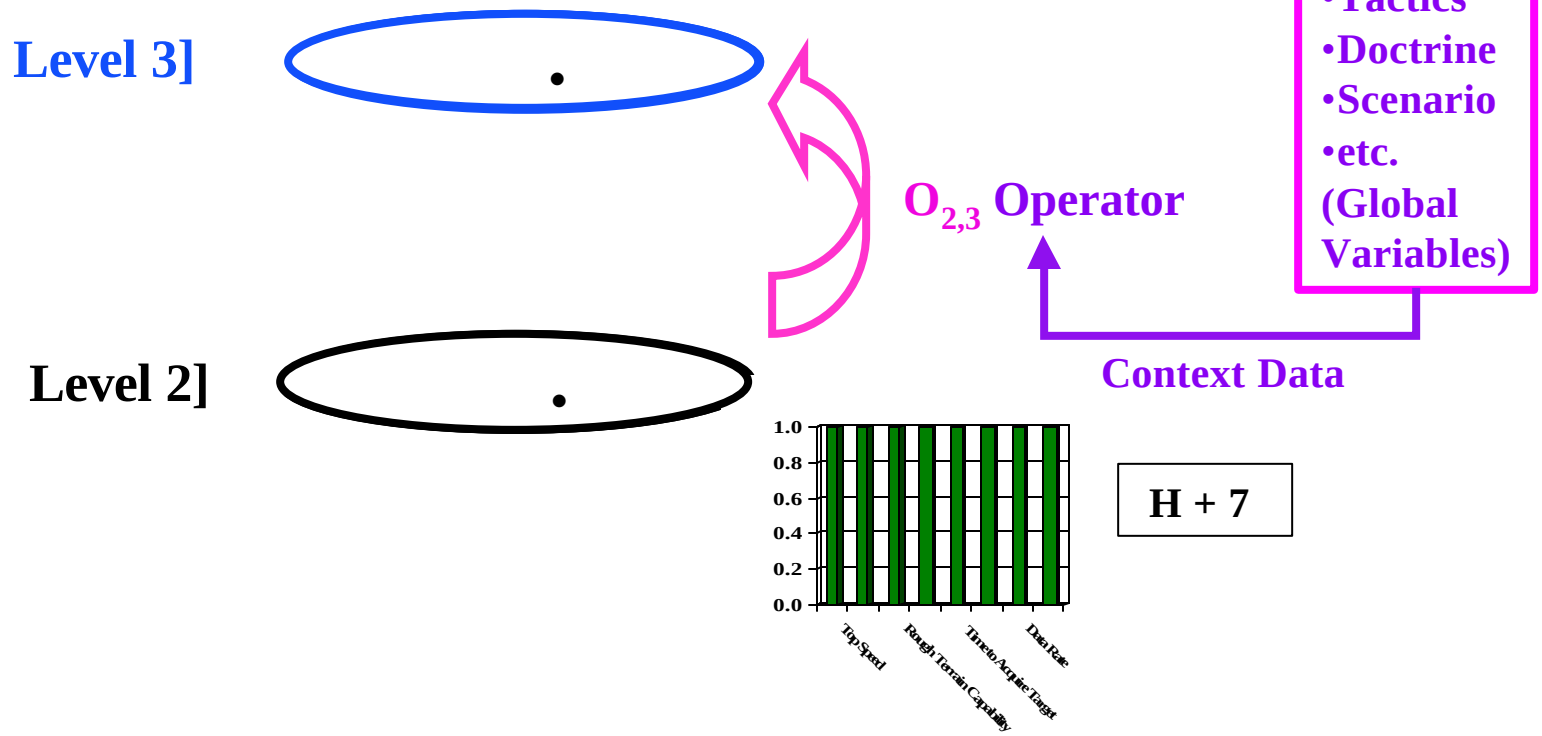
Level 3]

v_3[Top Speed, Max Range, Rough Terrain Capability, ...
Rate of Fire, Time to Acquire Tgt, Hit Dispersion, …
Data Rate, Data Latency, ...]

Military Operations Context

- Tactics
- Doctrine
- Scenario
- etc.

(Global Variables)



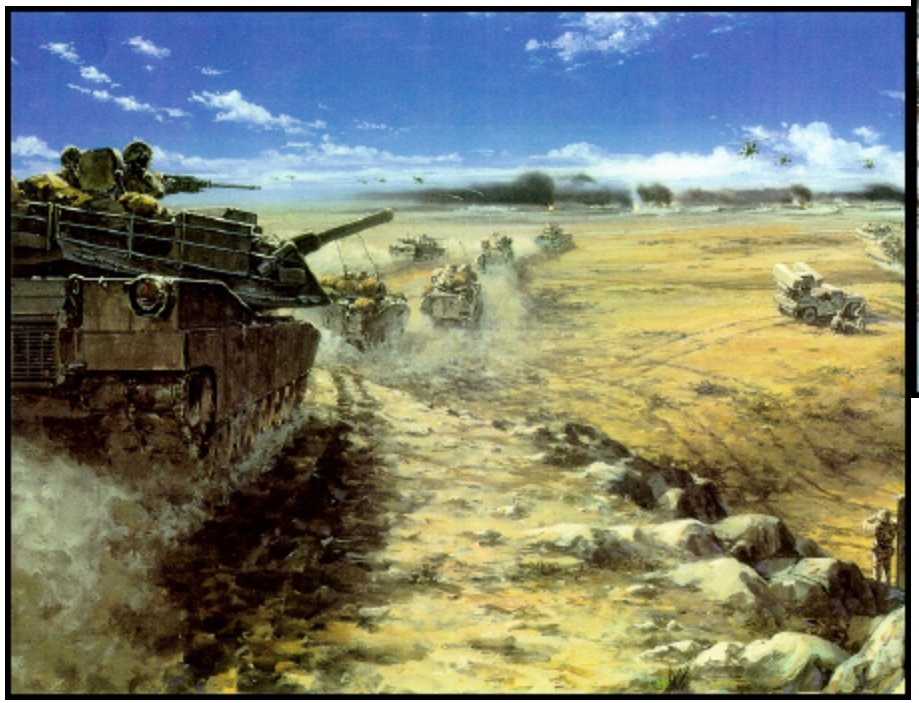
Mission Utility from Capabilities

Level 4]

Effectiveness?

Performance?

Lethality ?



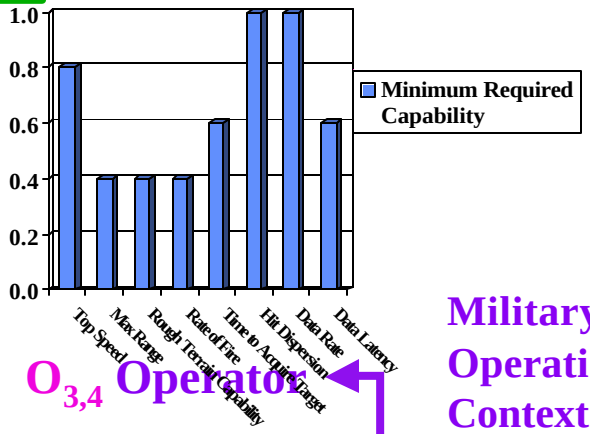
Survivability ?

Loss/Exchange ?

Readiness ?

Abstraction: Platform Utility

Level 4]

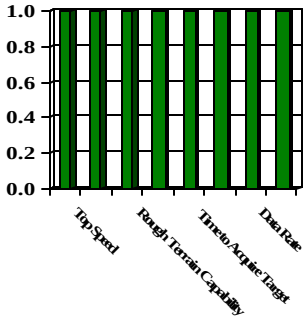


Level 4]

$O_{3,4}$ Operator

Military Operations Context

Msn Cap Reqs



H + 7

- Tactics
- Doctrine
- Scenario
- etc.

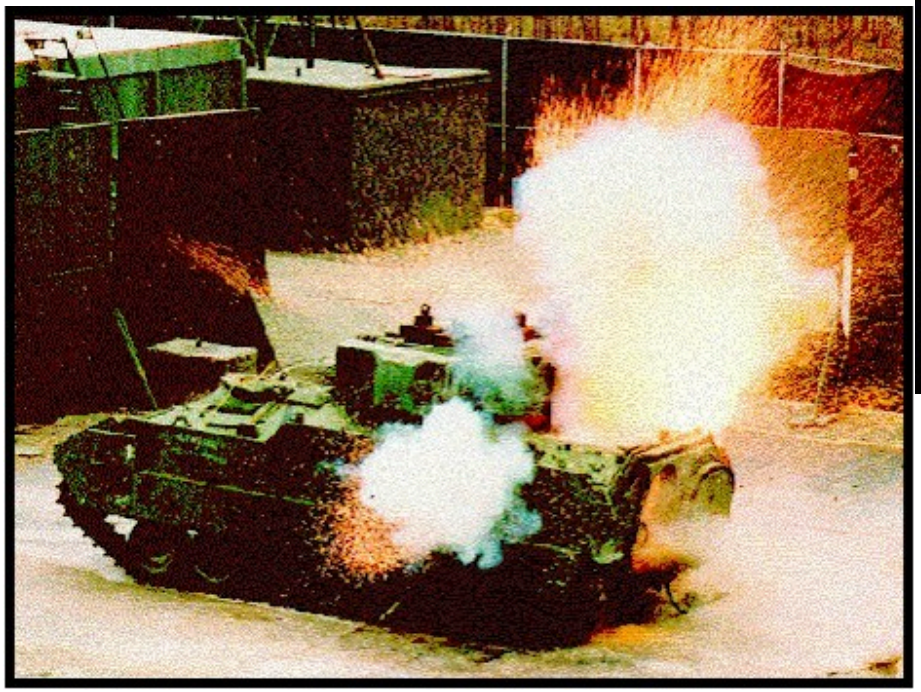
(Global Variables)

$O_{2,3}$ Operator

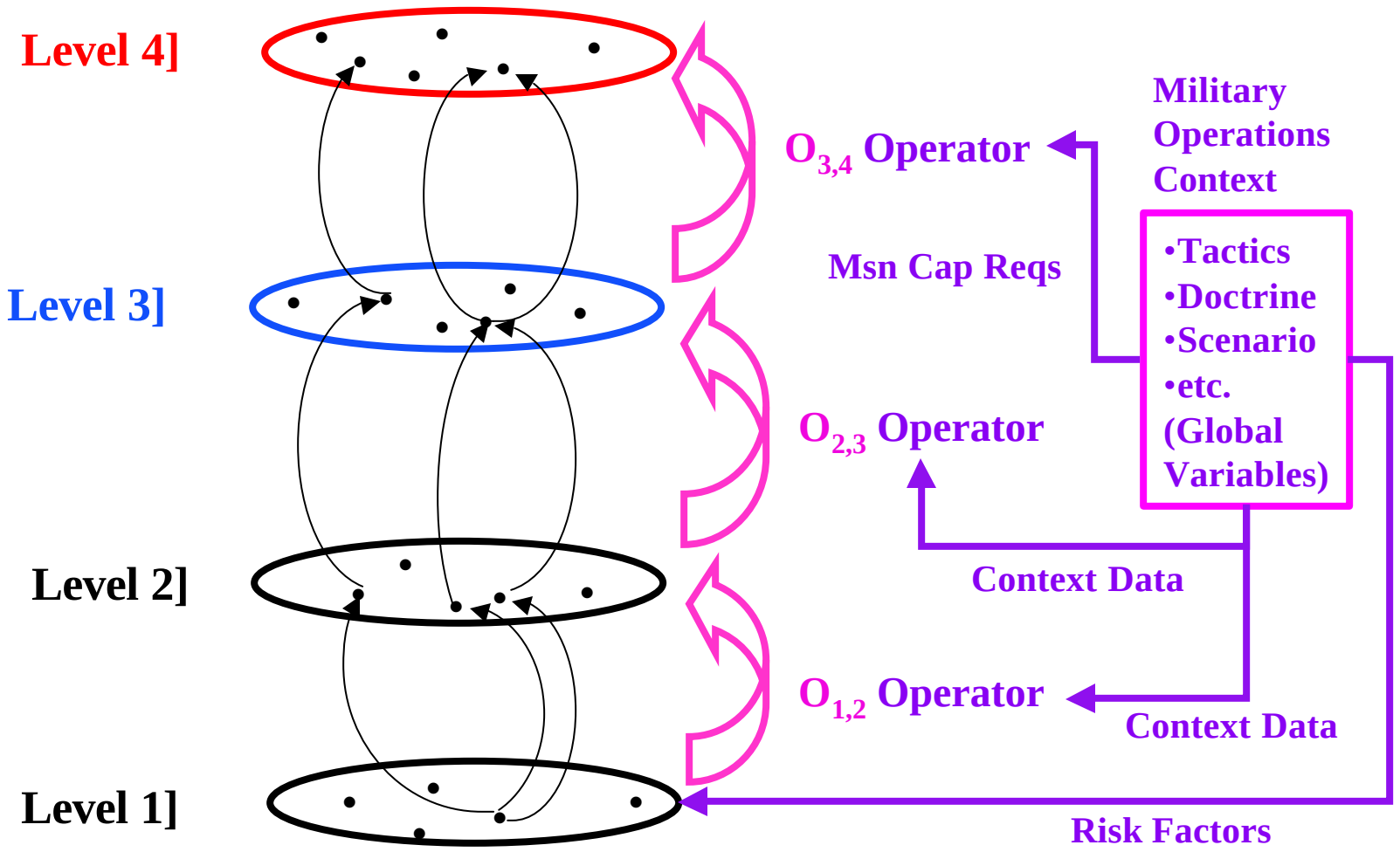
Level 2]

Context Data

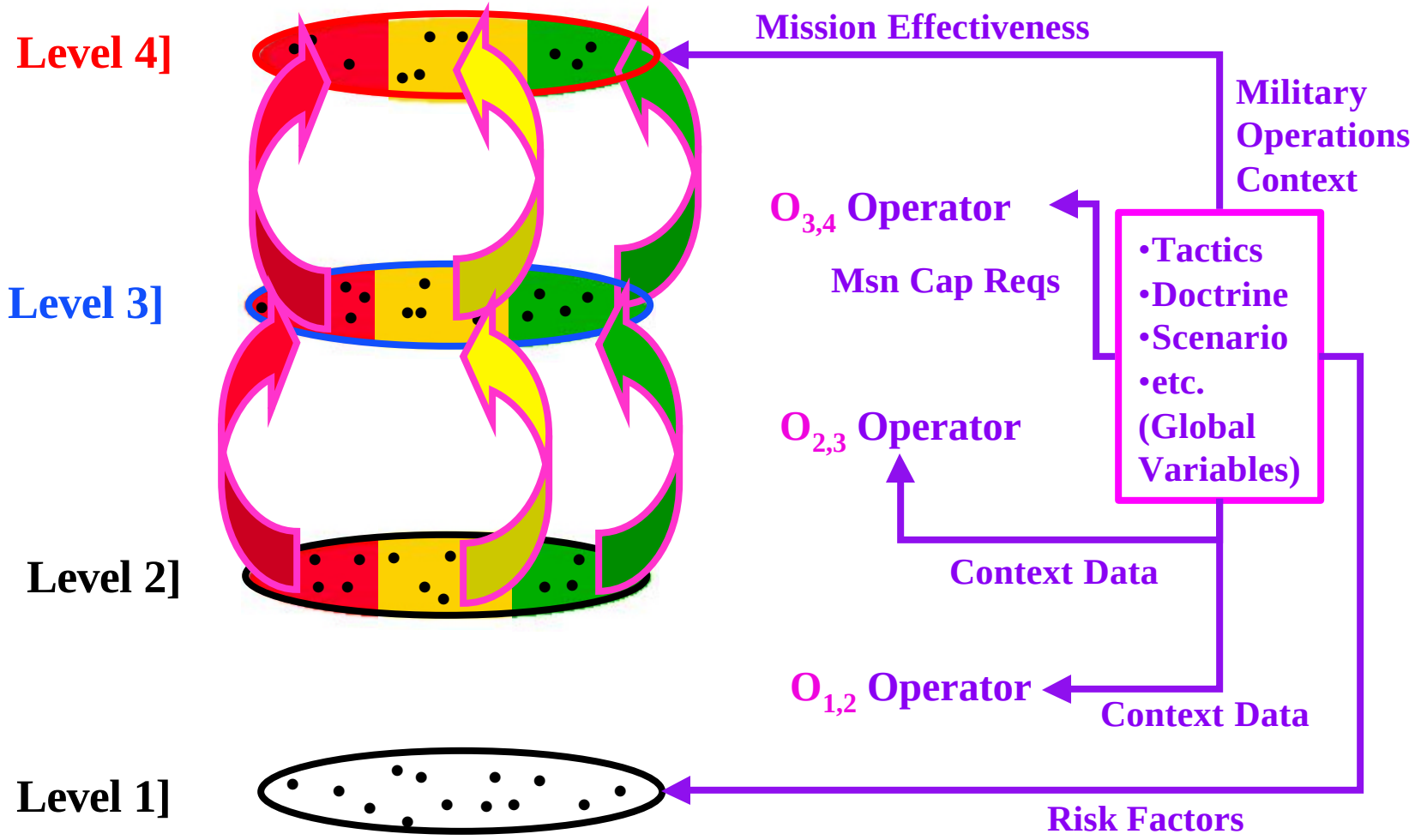
Physical Analogues for the $O_{1,2}$ Operator



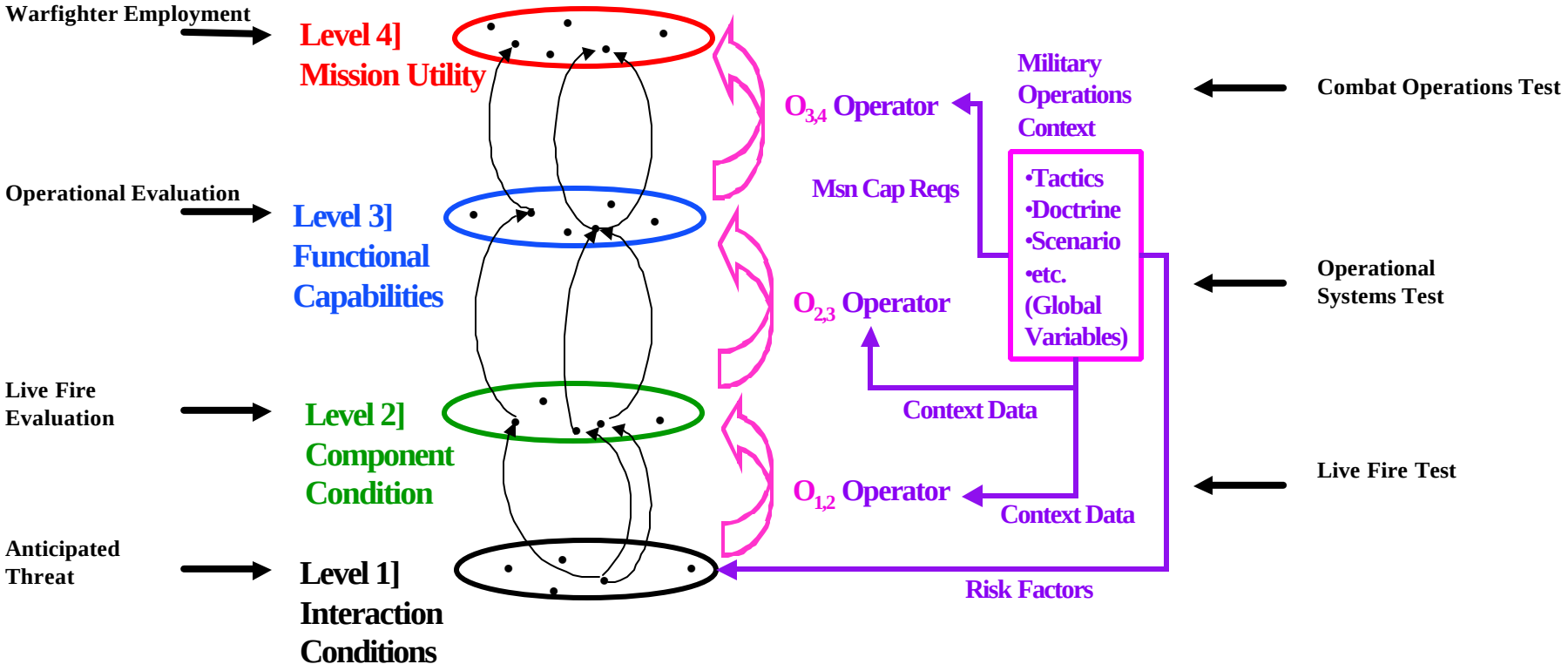
Abstraction: Platform Live-Fire Test Operator



Mission-Based Utility



V/L Taxonomy within MDRF



- Vulnerability/Lethality Taxonomy originally develop to organize Abrams LFT&E
- Live Fire Testing measures $O_{1,2}$ Operator
- Operational Testing measure the $O_{2,3}$ Operator
- $O_{3,4}$ Operator under development to provide the required to connect observable, measurable Materiel Capabilities (in the language of engineers) to Mission Utility (in the language of Warfighters.

Combined Arms Representation

ACQUIRE

ACQUIRE

ACQUIRE

COMMO

H + 5

Combined Arms Representation

ACQUIRE

ACQUIRE

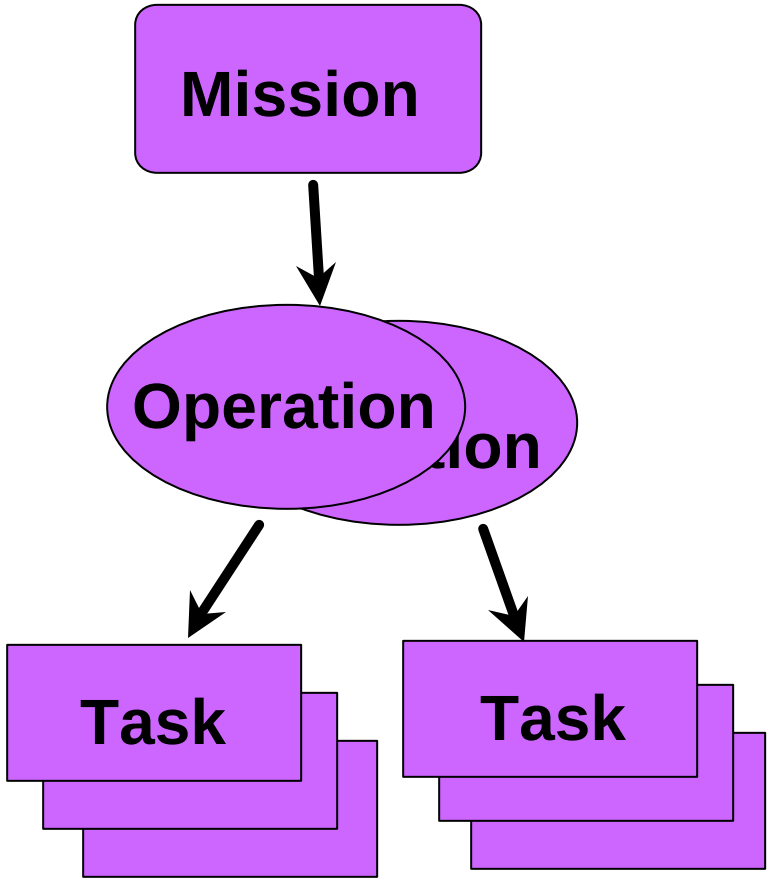
ACQUIRE

COMMO

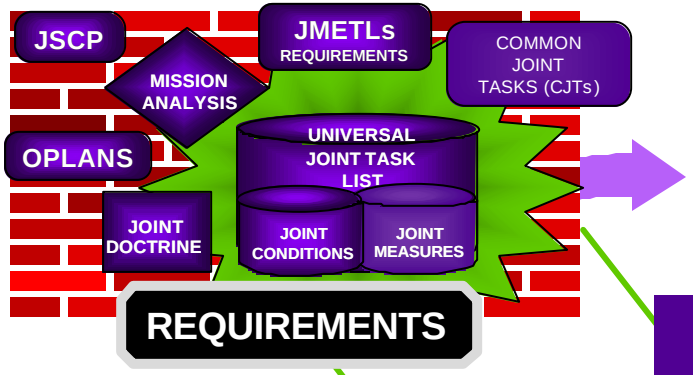
H + 5

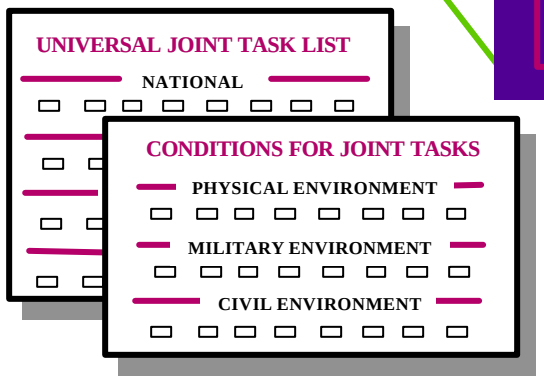
CONDUCT MISSION ANALYSIS

- **Mission is assigned to CINC. Concept of operations may include a number of operations.**
- **Operations, the building blocks of mission planning, are comprised of multiple tasks.**
- **Tasks are the fundamental building blocks of missions, and are executed by specific units or organizations.**



UNIVERSAL JOINT TASK LIST (UJTL)





CJCSM 3500.04A

UNIVERSAL JOINT TASK LIST

VERSION 3.0

13 SEPT 1996

TASKS

- Strategic Level
  - Strategic National Tasks
  - Strategic Theater Tasks
- Operational Level Tasks
- Service Tactical Task Lists

CONDITIONS

- Physical Environment
- Military Environment
- Civil Environment

MEASURES OF PERFORMANCE

- Measure
- Scale
- Criterion - Standard

DEFINITION OF MEASURE

Measures distinguish among varying levels of task performance. More than one measure may be specified for any single task.

Task:

OP 2.2.1 Collect Information on Operational Situation

Measures:

SCALE	MEASURE
Time	To retask collection asset
Time	Since most current intel. info. was collected
Percent	Of collection requirements filled
Percent	Of collection reqmts filled by multiple sources
Percent	Of targets accurately located
Percent	Of targets accurately identified

MISSION-BASED TASK STANDARDS

Standards express the degree to which (how well) a military organization or force must perform a task* under a specified set of conditions.

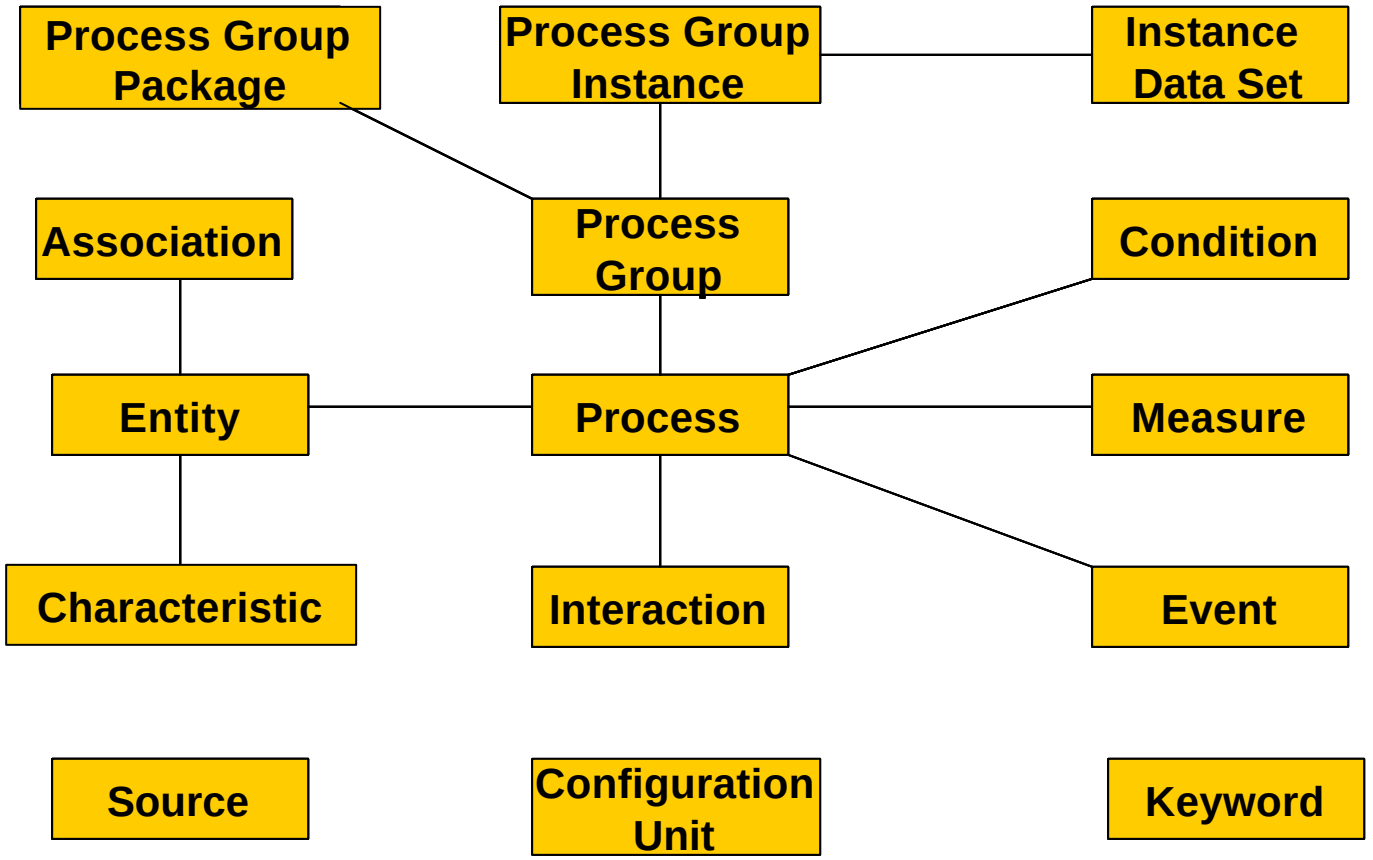
A criterion defines acceptable levels of performance for a measure and is often expressed as a minimum acceptable level of performance.

Standard:

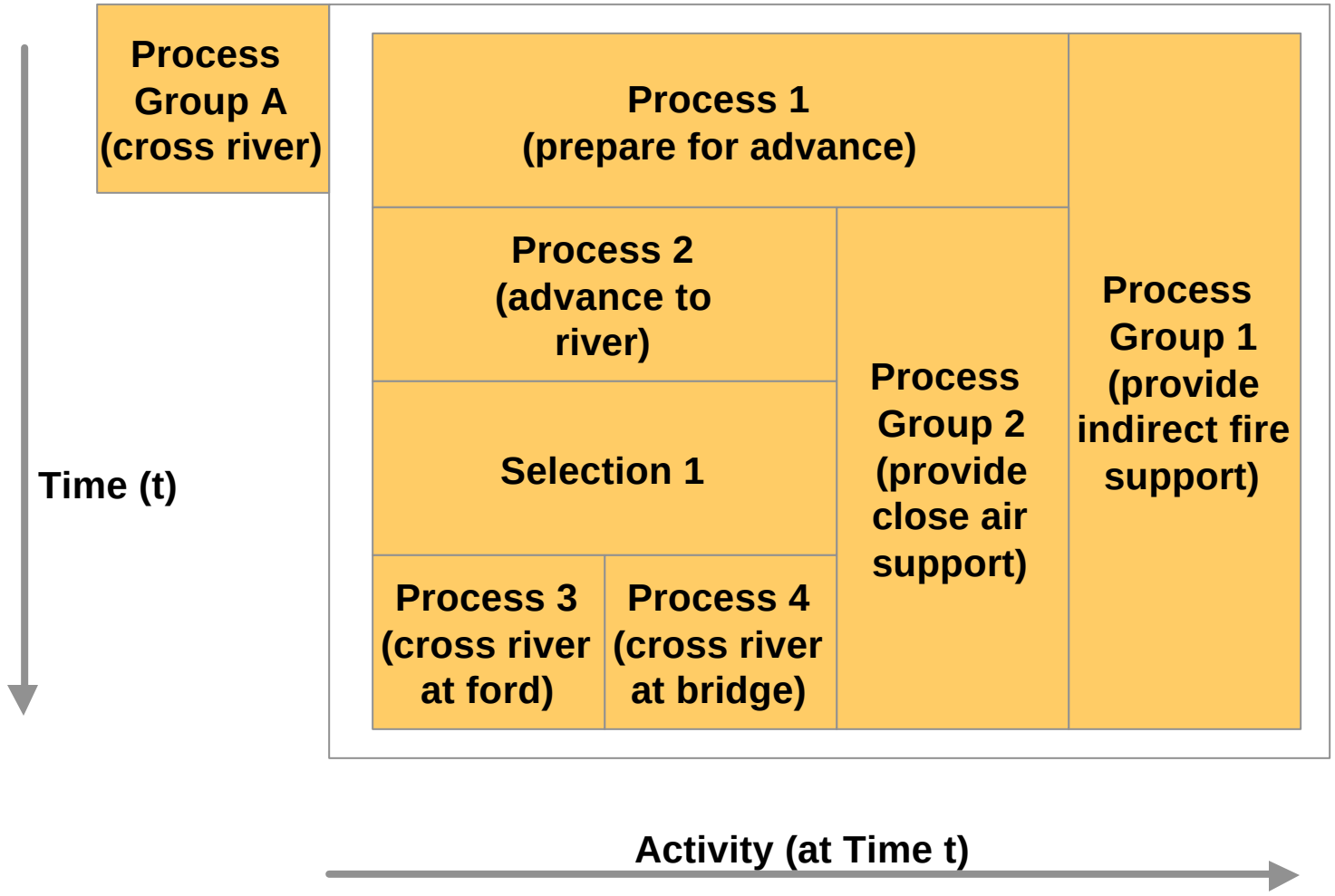
Criterion	Scale	Measure
100	km x km	sector search area
5	minute	sector search time
90	percent	probability of detecting threat
1	percent	false alarm rate

***e.g.;** Collect Information on Operational Situation (OP2.2.1)

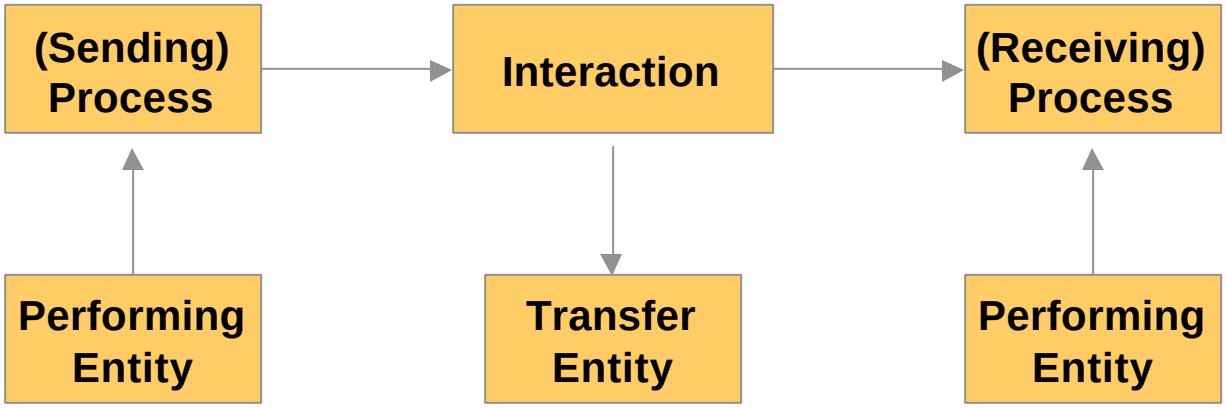
MDRF Semantics & Syntax



Level 4] oriented Operational View



Level 2] oriented Technical View



- An Interaction is a synchronization point between two processes
- An Interaction often involves a transfer of a quantity of an Entity, (ammunition, messages, resource allocations, task assignment, etc.)
- Examples of Interaction stereotypes
  - Allocation
  - Attack
  - Land (fighter on carrier)
  - Launch (missile)
  - Resupply
  - Transmission

M&S in Testing & Training

- Framing the Question
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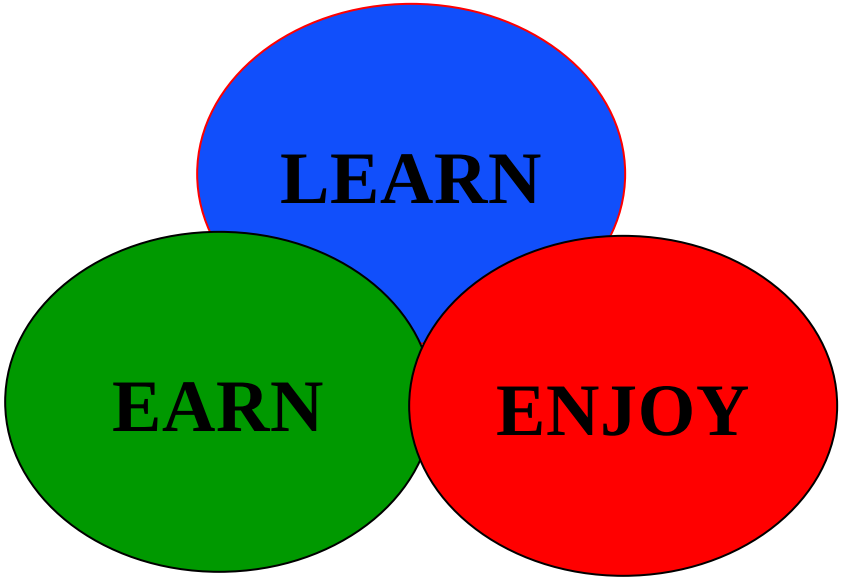
- Non-Military Example
- Military Operations in Urban Terrain Example

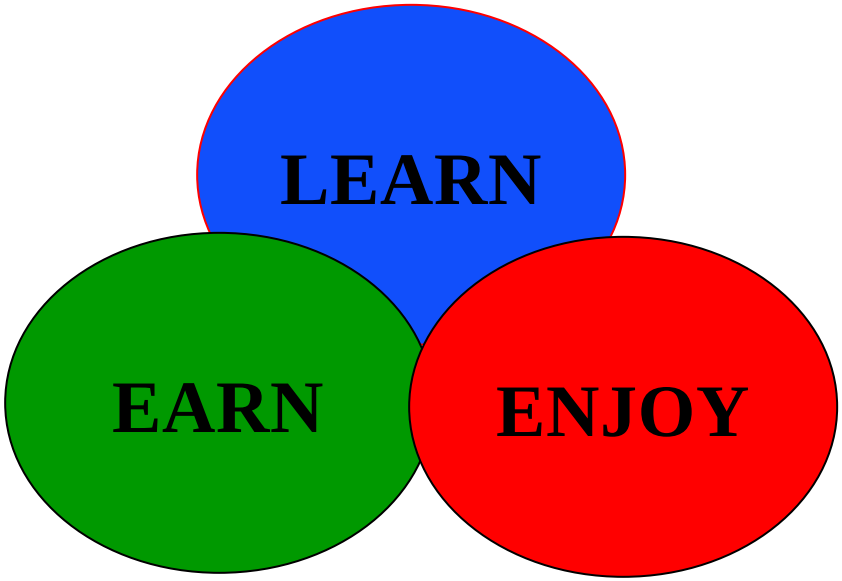
Non-Military Example:

Select an Automobile



- Level 4 MoE's: utility for Learn, Earn, Enjoy
- Level 3 MoP's: Tasks, Measures, Conditions, Standards

Missions:



- Primary Task: Transit, Carry
- Supporting Task: Consume, Protect, Park
- Ancillary Task: Display, Stimulate

Primary Tasks:

- Learn
  - Transit: to Class, to Library, to Activity
  - Carry: Student, Siblings, Peers, School Materials
- Earn
  - Transit: to Office, to Client, to Airport, to Lunch
  - Carry: Worker, Car Pool, Peers, Subordinates, Superior, Work Materials
- Enjoy:
  - Transit: to Supplies, to Entertainment, to Church, to Vacation
  - Carry: Family, Friends, Associates, Rec Materials

Supporting Tasks:

- Consume
  - Fuels, Fluids, Tires, Drive Train
- Park
  - At Home, At Work, Other
- Protect
  - During Collision

Ancillary Tasks:

- Display
  - Status, Style
- Stimulate
  - Senses, Ego

Measures of Performance:

- Cost:
  - purchase price, repair cost, supply cost, space occupied, useful life
- Capacity:
  - passengers, personal items, cargo
- Comfort:
  - ingress-egress, seating, climate control. Amenities
- Reliability:
  - MTF core function, MTF amenities, repair availability, expected downtime

Measures of Performance:

- Maneuverability:
  - turn radius, acceleration, speed, stability, dexterity, braking
- Survivability:
  - visibility, mass, energy absorption, protection volume, restraints
- Aesthetics:
  - shape, color, decor
- Resonance:
  - with personality

Conditions:

- Driver:
  - young, middle age, elderly
- Geography:
  - urban, suburban, rural, wilderness
- Road:
  - interstate, highway, blvd, city street, residential avenue
- Visibility:
  - dust, fog, precipitation
- Traction:
  - water, mud, ice, snow
- Traffic:
  - rush, midday, evening, late-night-early-morning

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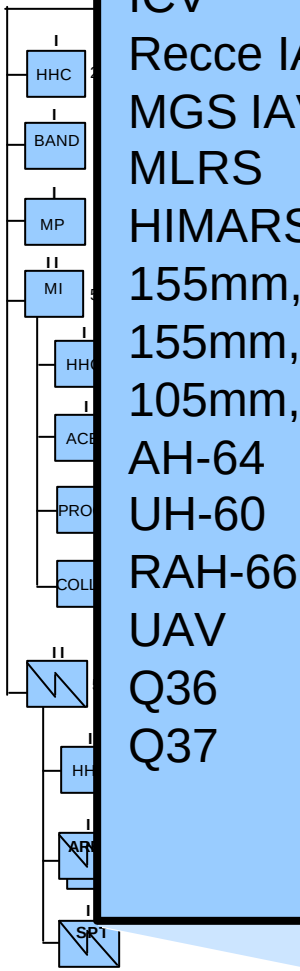
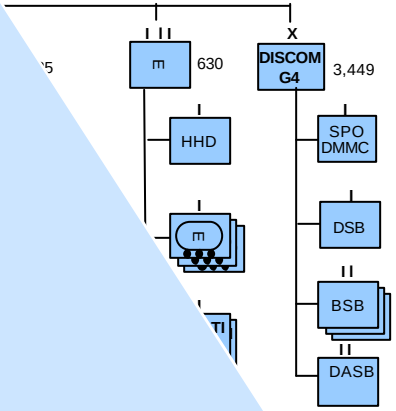
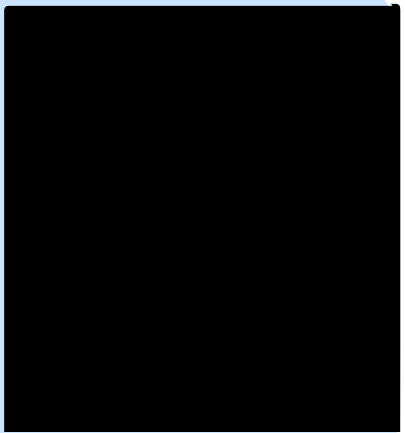
IDIV 3.0 Equipment Summary

ICV	336	M1	0
Recce IAV	148	M2/M3	0
MGS IAV	117	120mm Mort	68
MLRS	0	81mm Mort	90
HIMARS	6	60mm Mort	54
155mm, SP	54	Avenger	30
155mm, T	0	BSFV	0
105mm, T	0	HUMRAAM	12
AH-64	10	FOX/NBC IAV	12
UH-60	22	REMBASS	26
RAH-66	22	GSR	22
UAV	16	Prophet	12
Q36	3	ATGM/TOW	12
Q37	3	Javelin	393
		Dismounts	3,024







Bradley Fighting Vehicle

HMMWV

PANDUR

LAV III

Stating the Problem "the same old Physical Capabilities way"

Mission:
- **Main Battle Tank closes with and destroys enemy**

Key Performance Parameter:
- **90% probability of kill at 5000 meters.**

Will inevitably constrain the range of solutions to " the same old… "
Monolithic Single-Platform, Mechanically-Integrated Physical Hunter-Killer

Stating the Problem "the emerging Mission Capabilities way"

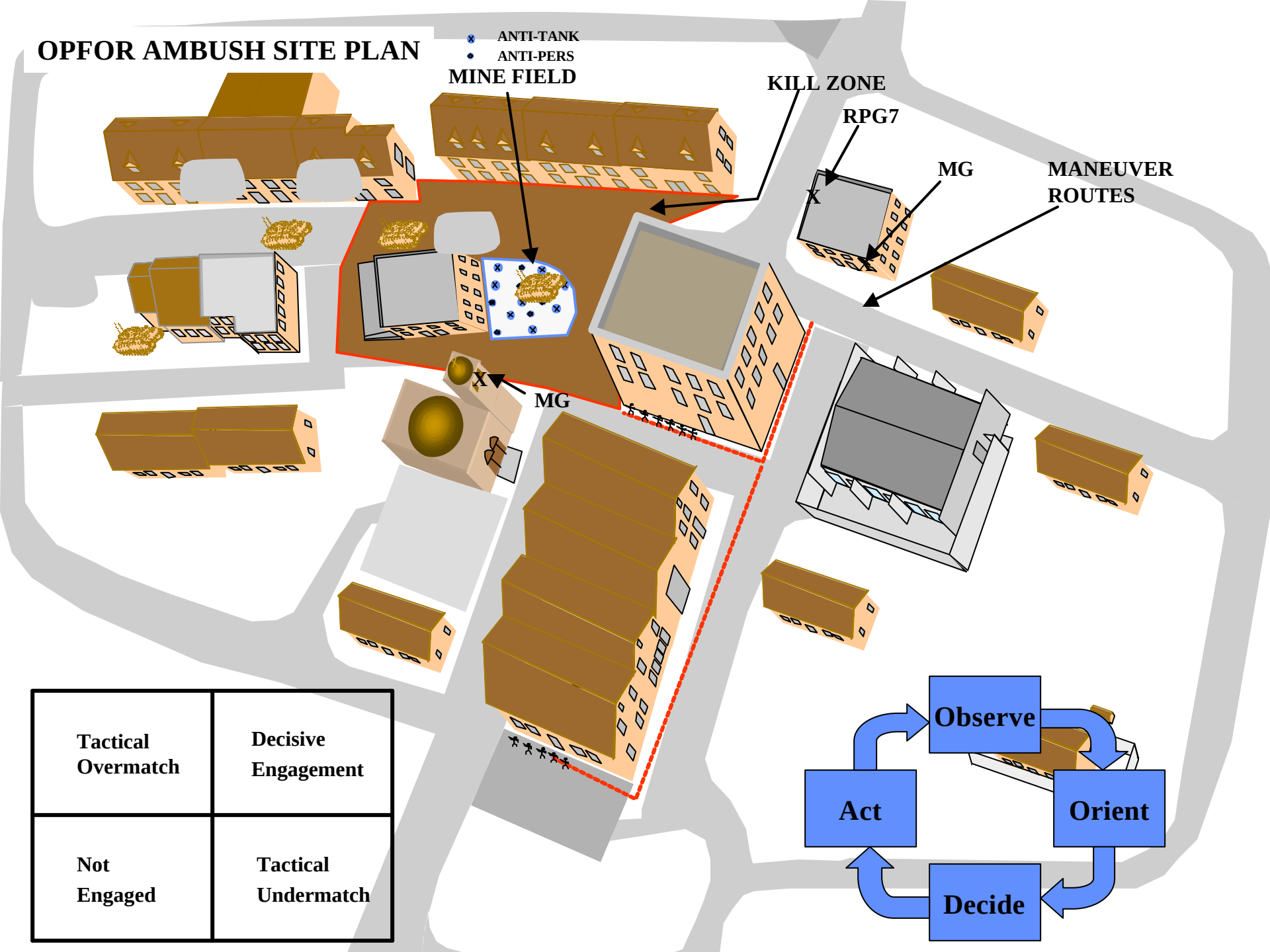
Mission:
- **FCS halts OPFOR advance by drawing the enemy into the open for destruction by an affordable combination of direct and indirect fires.**

Key Performance Parameter:
- **Prevent OPFOR firing platform closure to lethal firing positions on manned FCS platforms using awareness, stealth, mobility, and fire.**

Will open the range of solutions to consider " the emerging… "
Distributed Multi-Platform, Digitally-Integrated Virtual Hunter-Killer"

MOUT Ambush Example

- **Ambush thread:** focus on an example where survival depends on the ability to continue to fight after initial damage (e.g. mounted infantry survives a mine detonation but must deliver suppressing fire, move out of killing zone, and repair damage while under fire.)
- **Key components:**
  - Top-down decomposition of selected DPG scenario provides mission context. (Just the main thread)
  - Operationally Related Casualty Assessment (ORCA) for human physical capability
  - Functional Descriptions of the Mission Space (FDMS) for missions and tasks
  - V/L Taxonomy for materiel physical capability
  - Concise Theory of Combat (CTC) for combat interactions
  - Spatial Theory of Politics for human decision making
  - Luman and Nelson approaches for cost trades


OPFOR AMBUSH SITE PLAN
ANTI-TANK
ANTI-PERS
MINE FIELD
KILL ZONE
RPG7
MG
MANEUVER ROUTES
X
X
MG
Tactical Overmatch
Decisive Engagement
Not Engaged
Tactical Undermatch
Observe
Orient
Decide
Act

Methodology (1 of 2)

Level 4 scenario generation

1) Create road-to-war to provide mission context.

2) Select an organizing principle for Combat Interactions.

3) Use hierarchical Strategy-to-Mission-to-Task (S-M-T) decomposition to organize the Combat Processes.

4) Use hierarchical Order-of-Battle decomposition to complete assignment of Task-Organized forces to Combat Processes.

5) Establish Task-based fault tree for Mission success using Measures, Conditions, and Standards for desired End-States.

6) Construct integrated Use-Case-Threads to sequence execution of Combat Processes leading to Combat Interactions.

Methodology (2 of 2)

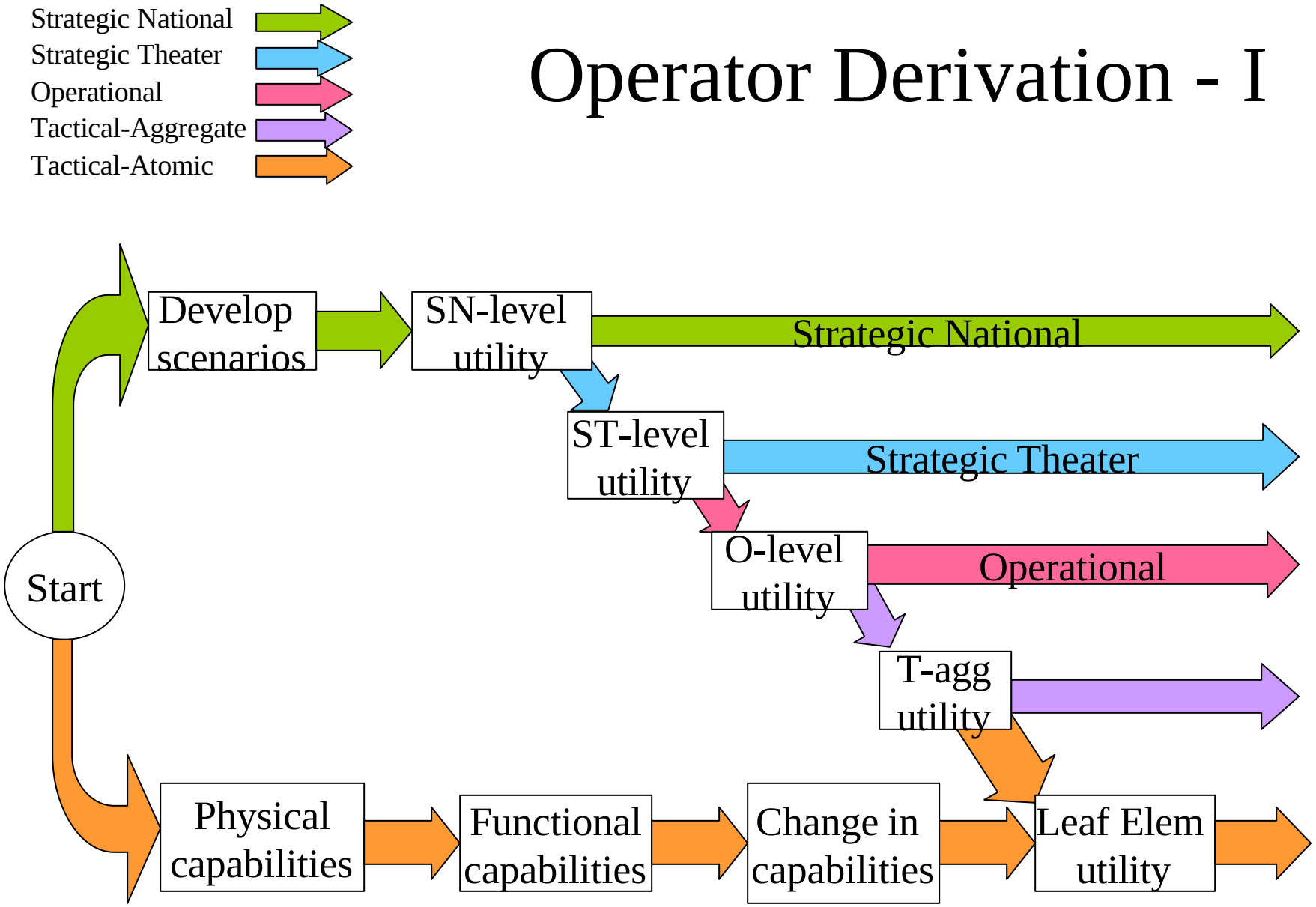
Compute Level 4 effectiveness from Level 3 performance

7) Compute Measures (of performance), under prescribed Conditions, and compare to Task-based fault tree Standards to determine the Mission outcome of a Combat Process following a Combat Interaction.

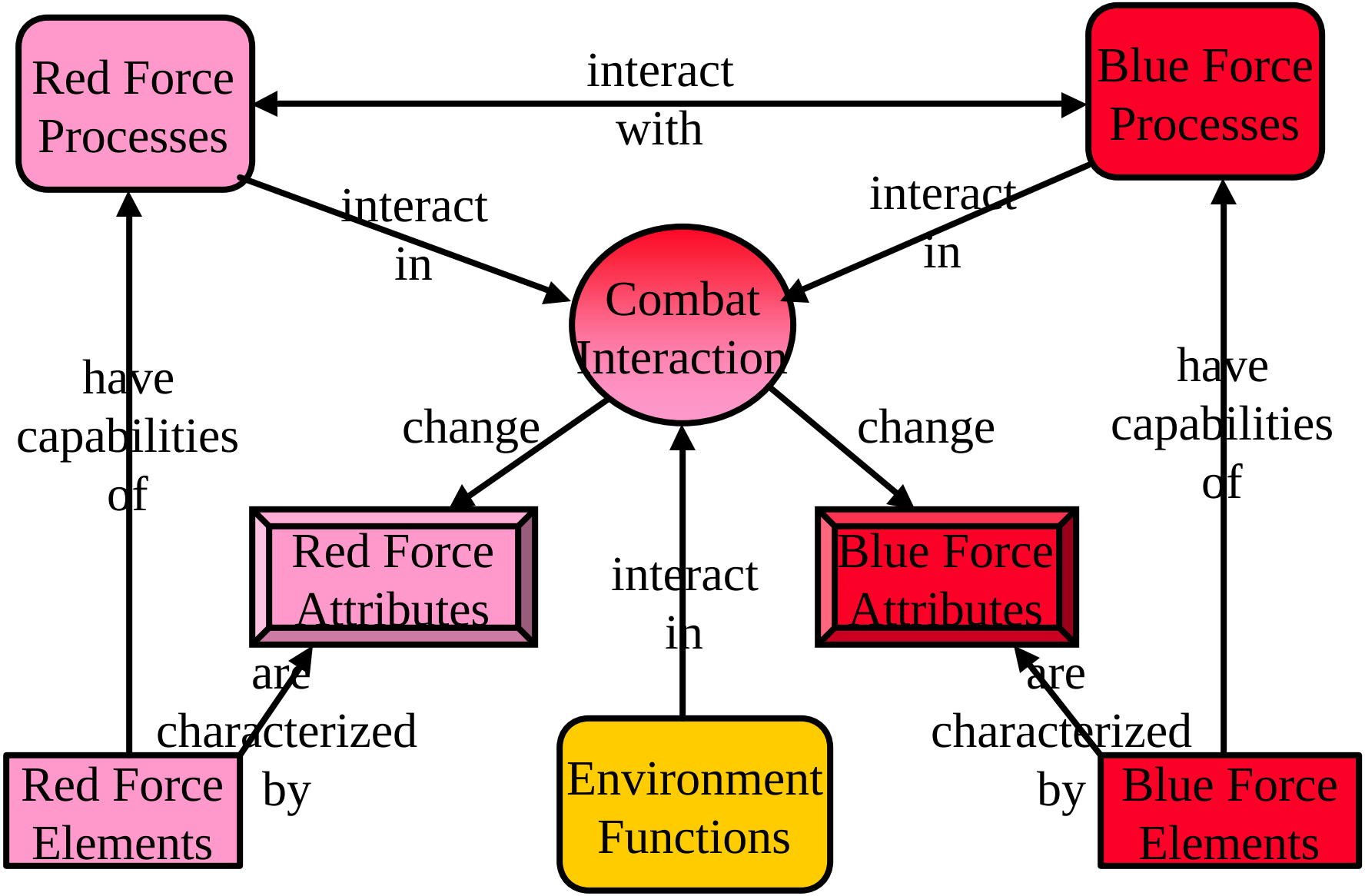
8) The outcome of a specific Combat Process affects other Combat Processes one of two ways: First, as a direct input to a subsequent task and second, by rolling up the S-M-T fault trees to where the branches connected to completed Task and the branches connected to the affected Task join (there may be many branches and many joins). In many cases, the influence will be implicit through a change in Conditions imposed on the Task rather than explicit through an input.

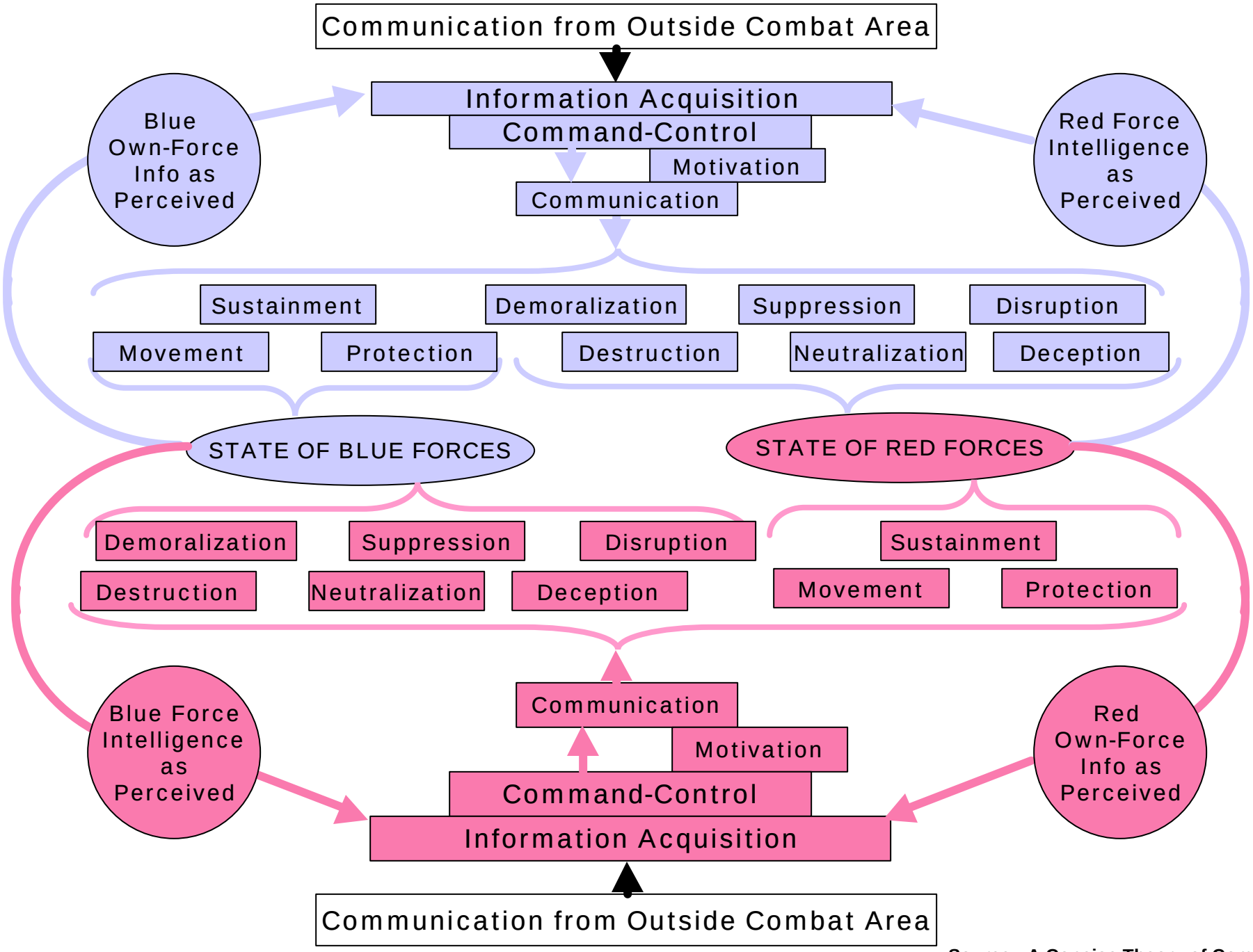
9) Warfighting utility is then expressed in terms of how the noted outcomes either enable or constrain Task execution within a Mission context. Resounding victory in many (but not enough) branches may not lead to overall Mission success; conversely, resounding defeat in many (but not critical) branches may still lead to overall Mission success.

Operator Derivation - I



Combat Descriptor Relationships





Source: A Concise Theory of Combat

Own Force, OPFOR Performance Interaction

- Time to Change Battle Field State

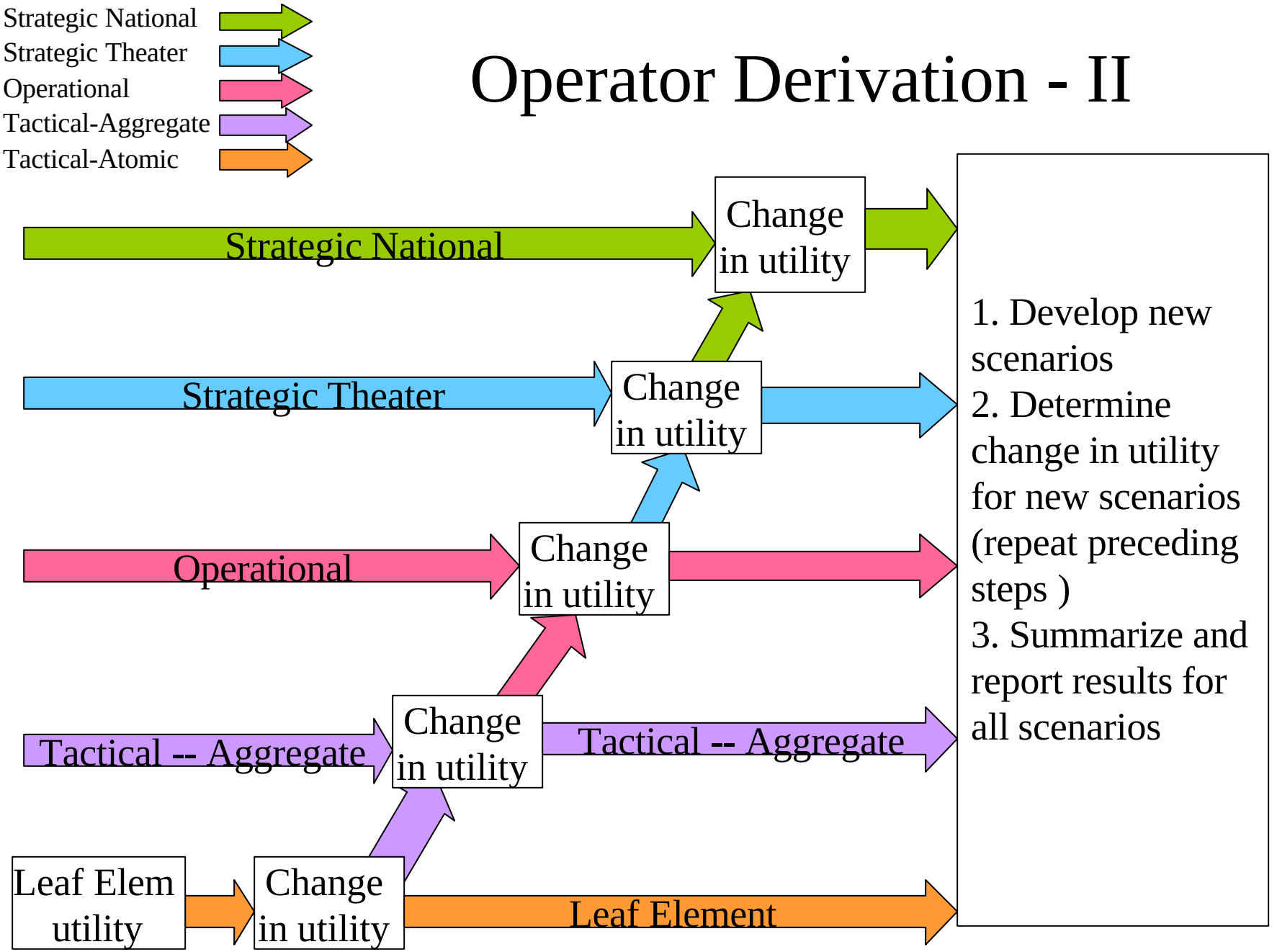
$$MOP_{Time} = \frac{t_r - t_b}{\sqrt{t_b t_r}}$$

- Tactical Speed Differential

$$MOP_{Speed} = \frac{s_b - s_r}{\sqrt{s_b s_r}}$$

- Vulnerability, Lethality Engagement Envelopes

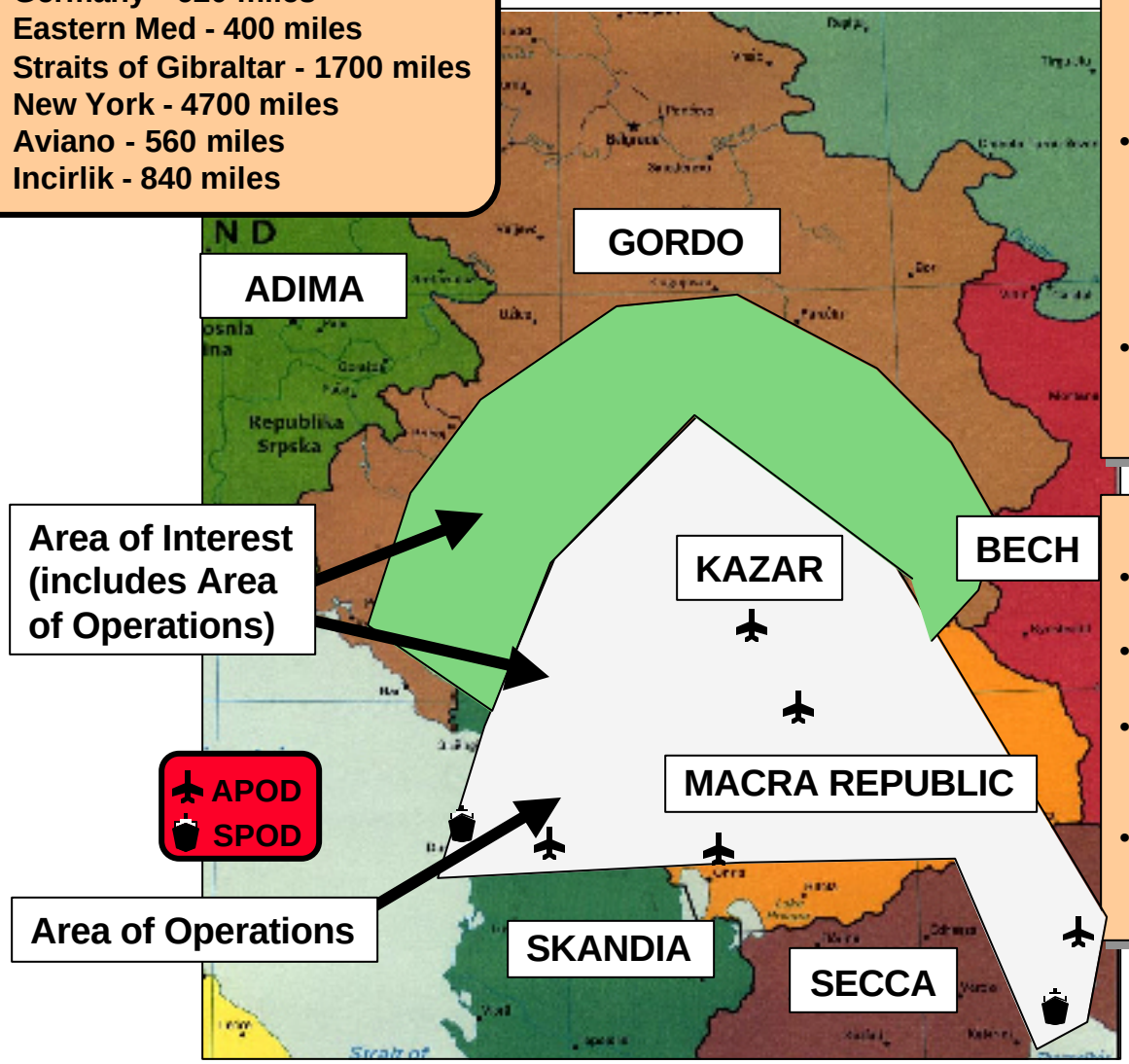
$$MOP_{Envelope} = \frac{m(V_r \cap L_b) - m(V_b \cap L_r)}{\sqrt{m\left(\bigcup (V_r \cap L_b)\right) m\left(\bigcup (V_b \cap L_r)\right)}}$$


Strategic National
Strategic Theater
Operational
Tactical-Aggregate
Tactical-Atomic
Operator Derivation - II
Strategic National
Change in utility
Strategic Theater
Change in utility
Operational
Change in utility
Tactical -- Aggregate
Change in utility
Tactical -- Aggregate
Leaf Elem utility
Change in utility
Leaf Element
1. Develop new scenarios
2. Determine change in utility for new scenarios (repeat preceding steps)
3. Summarize and report results for all scenarios

Area of Operations / Area of Interest

Dist

- Germany - 620 miles
- Eastern Med - 400 miles
- Straits of Gibraltar - 1700 miles
- New York - 4700 miles
- Aviano - 560 miles
- Incirlik - 840 miles

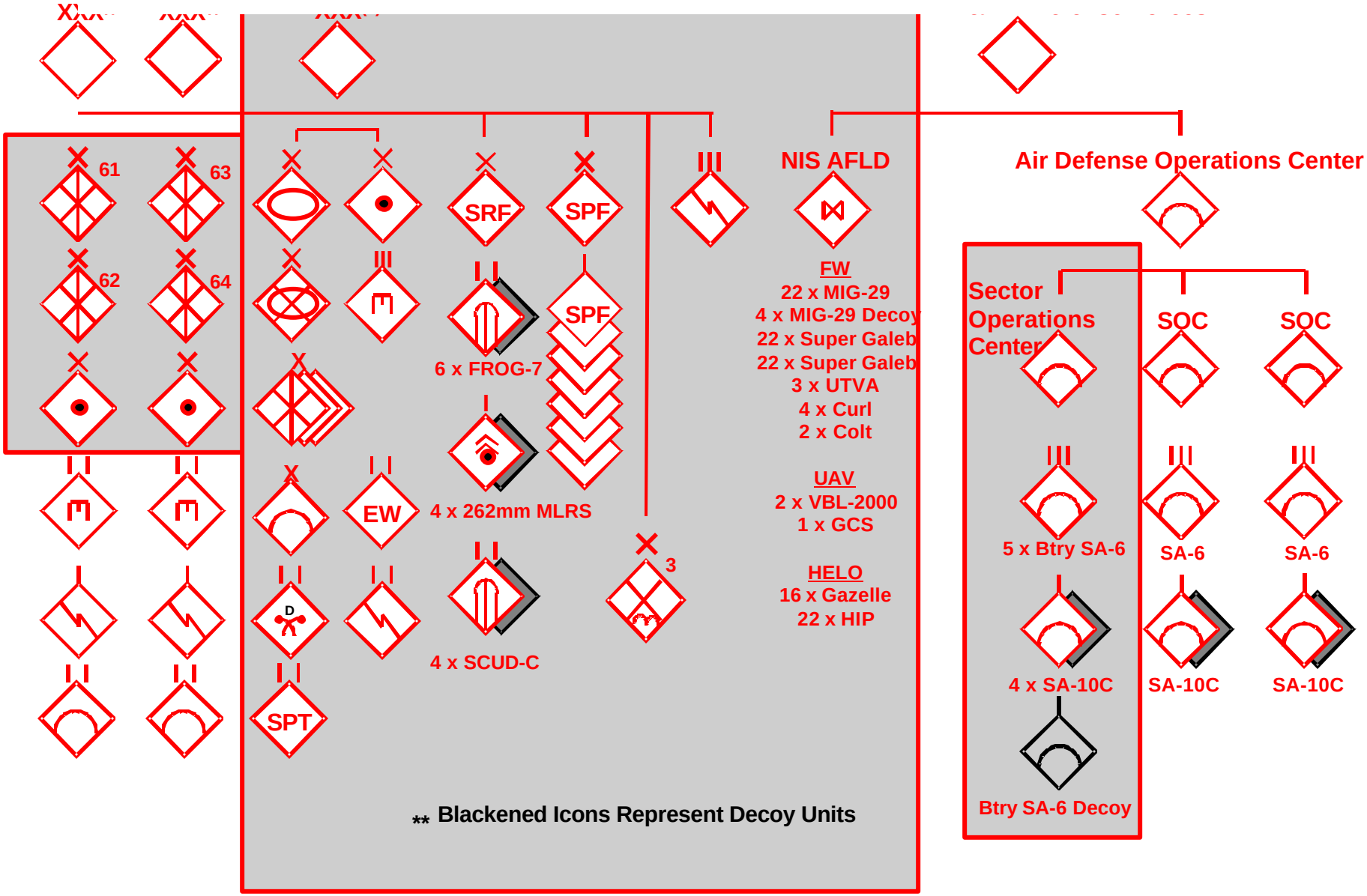


- Extremely varied; rich fertile plains in the north, limestone ranges and basins to the east, mountains and hills to the SE, extremely high shorelines to the SW
- Varying climate: cold winter and hot, humid summers with distributed rainfall in the north and central portion; along the coast, hot, dry summers and relatively cold winters with heavy snowfall inland
- Area controls one of the major land routes from Western Europe to Turkey; strategic location along the Adriatic Sea

Kazar

- Republic of Gordo's southern-most province; landlocked
- Land Area: 11,000 square kilometers (slightly smaller than Connecticut)
- Bordered by Greater Gordo to north, Macra Republic to southeast, and Skandia to the southwest
- Theater of operations includes Kazar, Macra, Skandia, Secca, Gordo, Adriatic Sea, and Aviano, Italy (Air Force)

Gordian Campaign Participants



Road to War (1 of 2)

- **The swift collapse of Slavia in 1991 was followed by destructive warfare, destabilization of boundaries, and renewed ethnic conflict.**
- **Kazar, an autonomous province in southern Gordo and a former part of Slavia, sought its independence in 1998 since the majority of the population consisted of ethnic Skandians, while the minority consisted of ethnic Gordians.**
- **Following the collapse of the negotiations, Gordo introduced forces into Kazar. In May 1999, a NATO campaign forced the withdrawal of Gordian forces, allowing for the introduction of NATO-led InternationalStabilization Force (SFOR) peacekeeping forces.**
- **Tensions between ethnic Skandians and ethnic Gordians in Kazar abated by March 2006, Kazar declared independence. Gordo had no response to the independence declaration.**

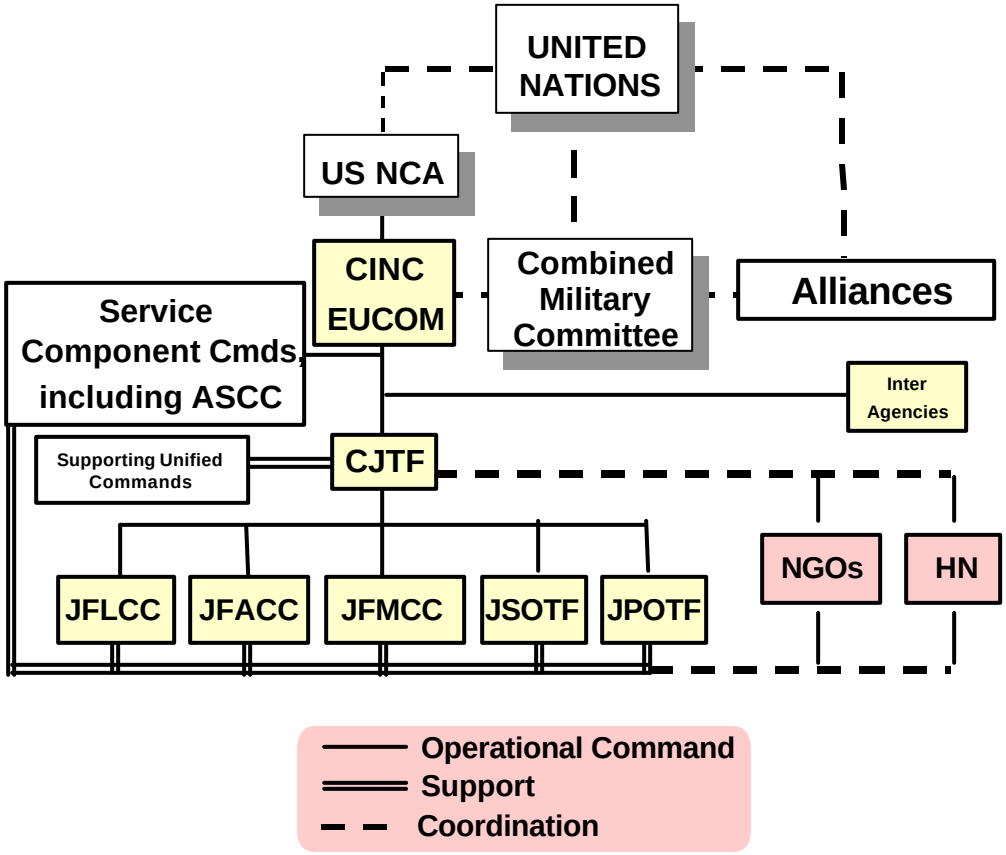
In October 2006, the UN implemented a democratic elections monitoring program that apparently solidified Kazar's move for independence.

- **In April 2007, the NATO-led InternationalSFOR began training the Kazarian Protection Corps (KPC), as a defense force.**
- **By March 2009, NATO forces withdrew from Kazar. Only a small U.N. observer mission replaced the NATO forces. Monitored by U.S. intelligence, who retained interest in Gordian activities, 1st Gordian Corps conducted its regularly scheduled FTX near the Kazarian border.**
- **In May of 2009, ethnic Skandians in Kazar, led by th KPC, began retaliatory attacks on ethnic Gordians in Kazar. The Kazarian government condemned the activities.**
- **In May 2009, a splinter group of the KPC began limited cross-border incursions into pro-Skandian areas of Gordo.**

Road to War (2 of 2)

- In June 2009, 1st Gordian Corps conducted a CPX, instead of its customary FTX, with its known organic units.
- In October 2009, 1st Gordian Corps conducted a CPX, and U.S. intel sources detected the participation of four additional entities (assumed to be brigade HQs) in the CPX.
- In November 2009, Gordo requested, but did not receive, U.N. support in stopping KPC activities. With growing national support for stopping the Kazarian attacks, Gordo began infiltrating unconventional units into Kazar to protect ethnic Gordians.
- In January 2010, Gordo moved conventional forces along Kazar's northern, eastern, and western border to contain increasingly vicious KPC activities.
- Also, Gordian unconventional warfare units, estimated to number 800 personnel, set off explosions in a number of northern and northeastern towns in Kazar.
- The KPC responded to the Gordian attacks by murdering 37 ethnic Gordians in the city of Urosevac. Civil unrest was heightened by the escalating conflict.
- In February 2010, Gordo conducted a CPX, confirming the inclusion of the four additional brigades in 1st Gordian Corps.
- On 16 February 2010, Kazar petitioned the U.N. for immediate assistance in eliminating the threat created by the Gordian unconventional forces incursion, deterring the conventional Gordian threat, and stabilizing the province.
- Following Kazar's petition, the U.S. executed a series of Force Deployment Options including the deployment of an Interim Brigade Combat team (IBCT) to Thessaloniki in Secca on 26 February.
- On 1 March 2010, U.S. intel assets detected Gordian conventional units infiltrating into Kazar.
- On 1 March 2010, the U.N. authorized military operations under the previous peacekeeping charter and the U.S. NCA authorized the employment of U.S. military forces.

Missions



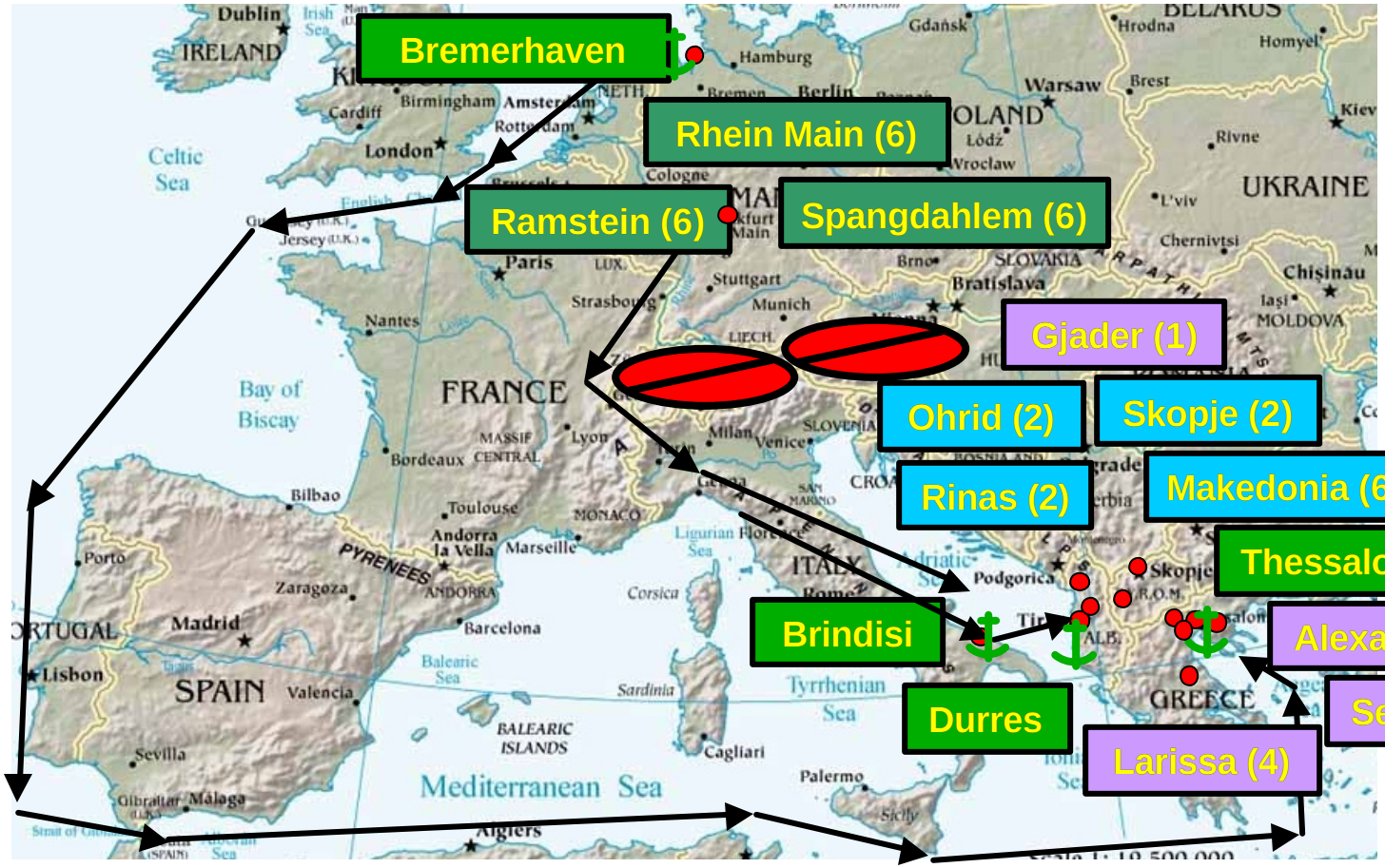
ARFOR/JFLCC Mission

On order, the ARFOR/JFLCC deploys to deter invasion of Gordian conventional forces and to defeat Gordian unconventional forces. On order attacks to defeat and eject invading Gordian forces from Kazar to restore the territorial integrity of Kazar. On order conducts SASO. On order conducts handover to U.N. forces and re-deploys.

IDIV Mission

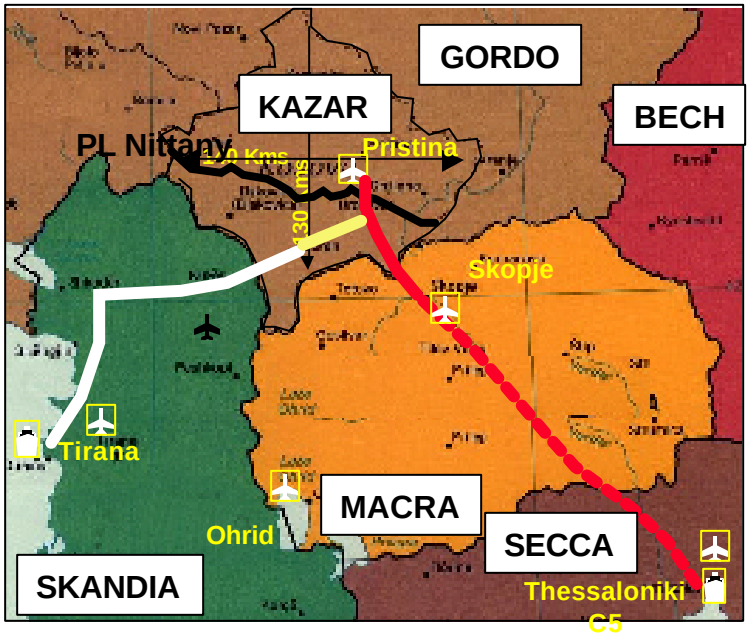
IDIV attacks in zone to defeat Gordian forces. On order, secures the zone to enable forward passage of MEB and 1ID(M)(-) north of PL Nittany and to set the conditions for peacekeeping operations.

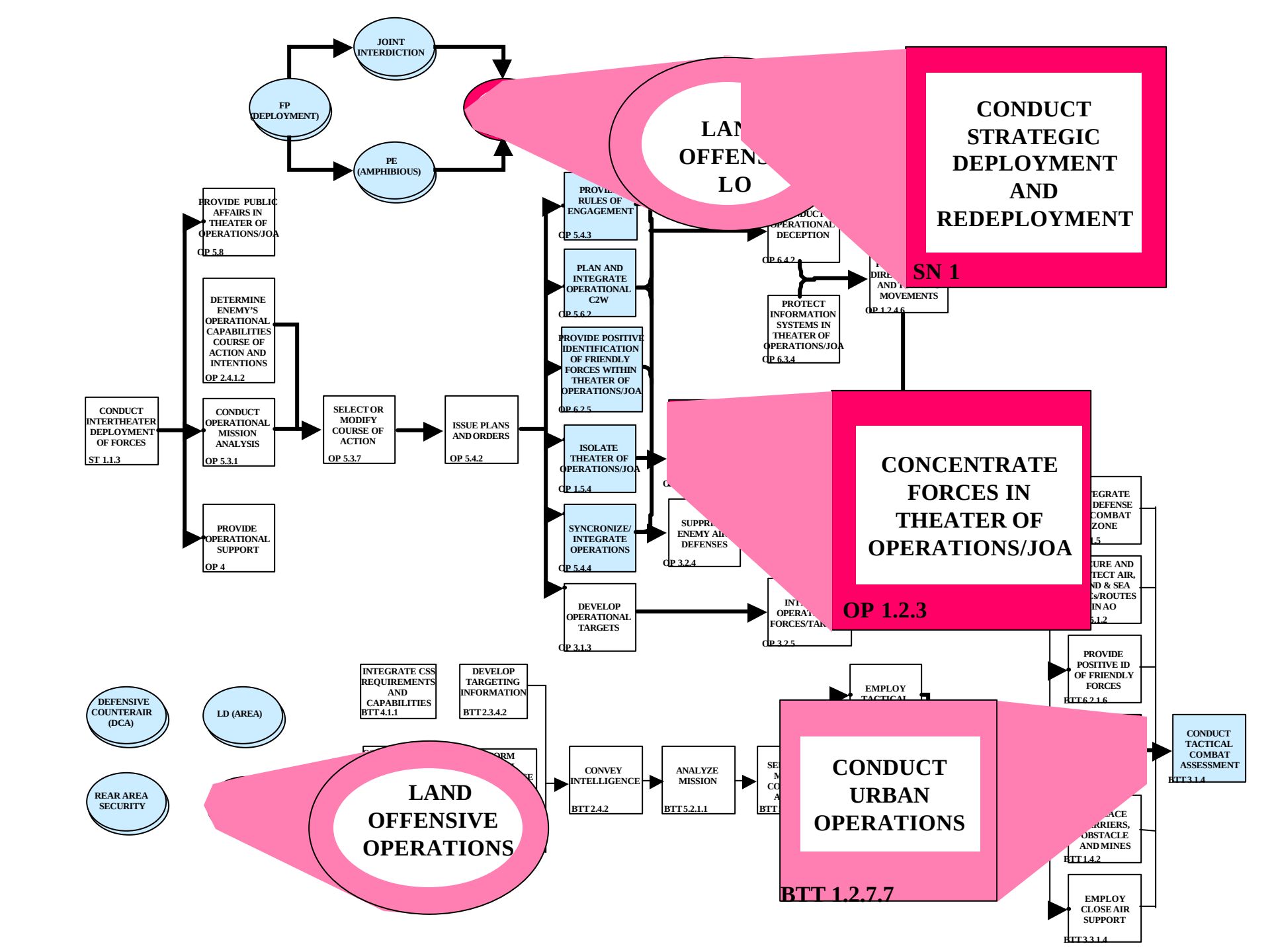
En Route Structure



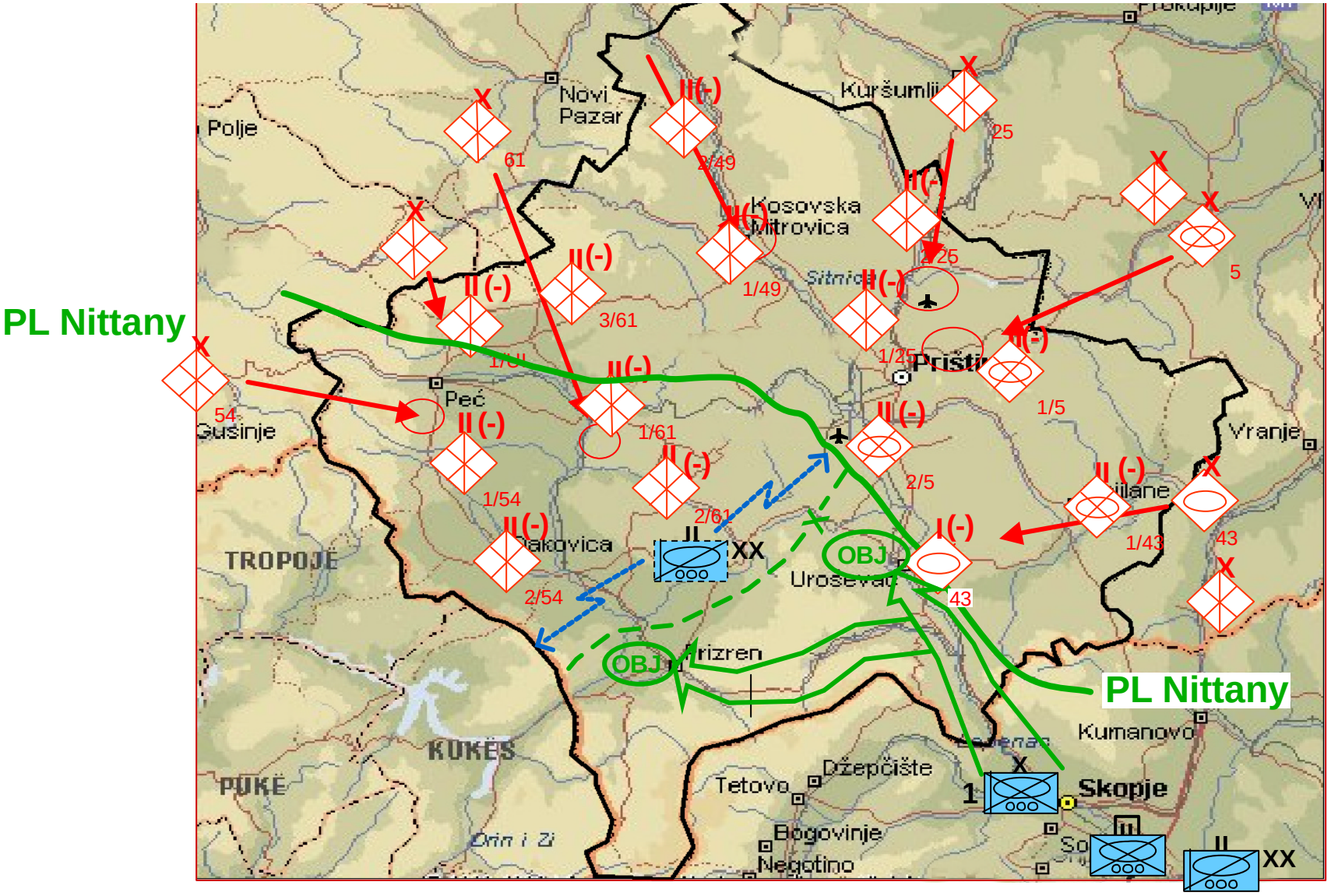
Mobility Routes and Corridors

- **Durres (SPOD) - Tirana (APOD) to Prizren (includes Kukes-Prizren Corridor)**
- **Skopje (APOD) to Urosevac (includes Kacanic Pass)**
- **East-West corridor of Kazar (Urosevac-Prizren)**

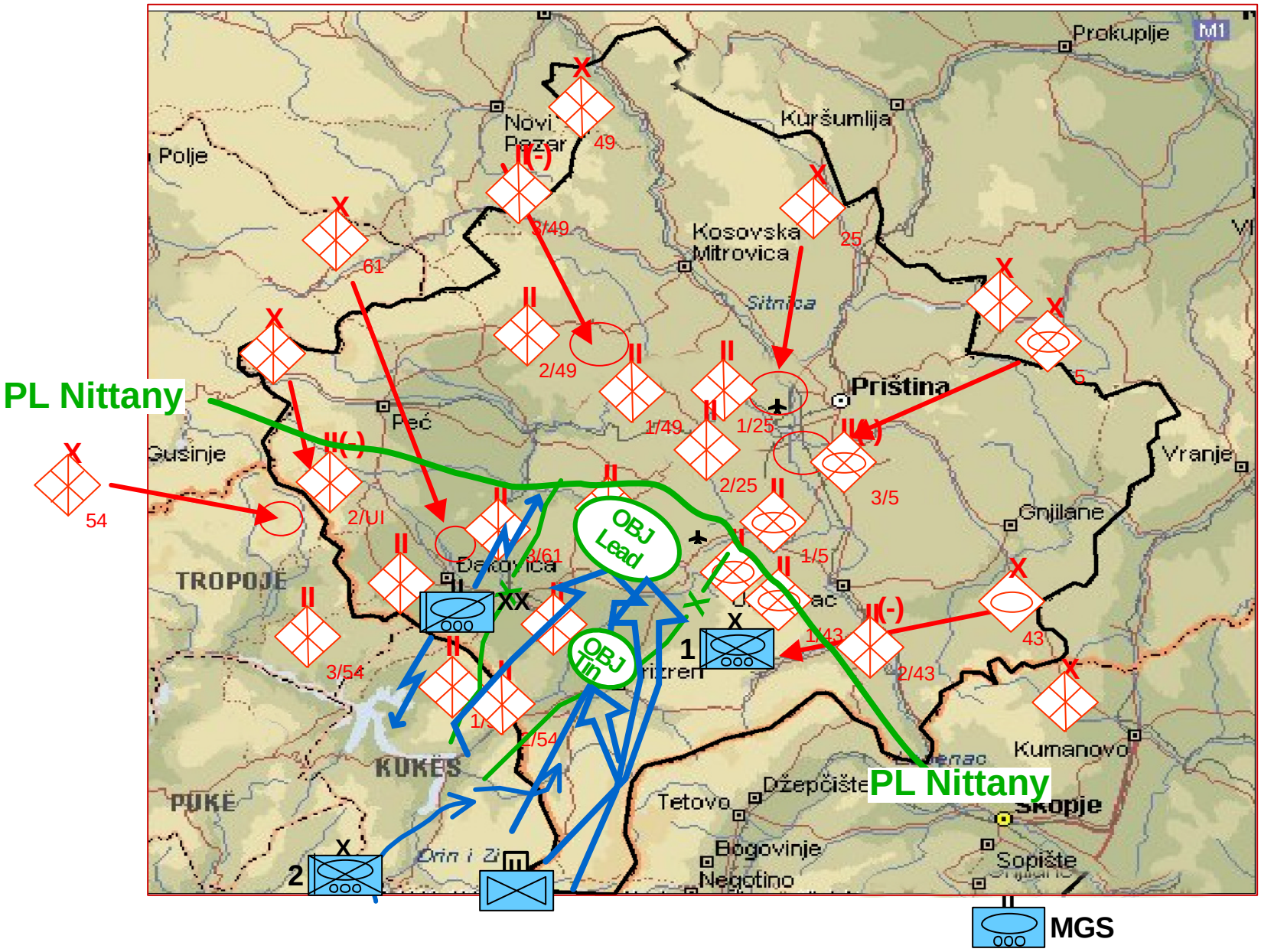



JOINT INTERDICTION
FP (DEPLOYMENT)
PE (AMPHIBIOUS)
CONDUCT STRATEGIC DEPLOYMENT AND REDEPLOYMENT
SN 1
PROVIDE PUBLIC AFFAIRS IN THEATER OF OPERATIONS/JOA
OP 5.8
DETERMINE ENEMY'S OPERATIONAL CAPABILITIES COURSE OF ACTION AND INTENTIONS
OP 2.4.1.2
CONDUCT INTERTHEATER DEPLOYMENT OF FORCES
ST 1.1.3
CONDUCT OPERATIONAL MISSION ANALYSIS
OP 5.3.1
PROVIDE OPERATIONAL SUPPORT
OP 4
SELECT OR MODIFY COURSE OF ACTION
OP 5.3.7
ISSUE PLANS AND ORDERS
OP 5.4.2
PROVIDE RULES OF ENGAGEMENT
OP 5.4.3
PLAN AND INTEGRATE OPERATIONAL C2W
OP 5.6.2
PROVIDE POSITIVE IDENTIFICATION OF FRIENDLY FORCES WITHIN THEATER OF OPERATIONS/JOA
OP 6.2.5
ISOLATE THEATER OF OPERATIONS/JOA
OP 1.5.4
SYNCRONIZE/ INTEGRATE OPERATIONS
OP 5.4.4
DEVELOP OPERATIONAL TARGETS
OP 3.1.3
PROTECT INFORMATION SYSTEMS IN THEATER OF OPERATIONS/JOA
OP 6.3.4
CONCENTRATE FORCES IN THEATER OF OPERATIONS/JOA
OP 1.2.3
PROVIDE POSITIVE ID OF FRIENDLY FORCES
BTT 6.2.1.6
CONDUCT TACTICAL COMBAT ASSESSMENT
BTT 3.1.4
DEFENSIVE COUNTERAIR (DCA)
LD (AREA)
REAR AREA SECURITY
INTEGRATE CSS REQUIREMENTS AND CAPABILITIES
BTT 4.1.1
DEVELOP TARGETING INFORMATION
BTT 2.3.4.2
CONVEY INTELLIGENCE
BTT 2.4.2
ANALYZE MISSION
BTT 5.2.1.1
LAND OFFENSIVE OPERATIONS
CONDUCT URBAN OPERATIONS
BTT 1.2.7.7
EMPLOY CLOSE AIR SUPPORT
BTT 3.3.1.4

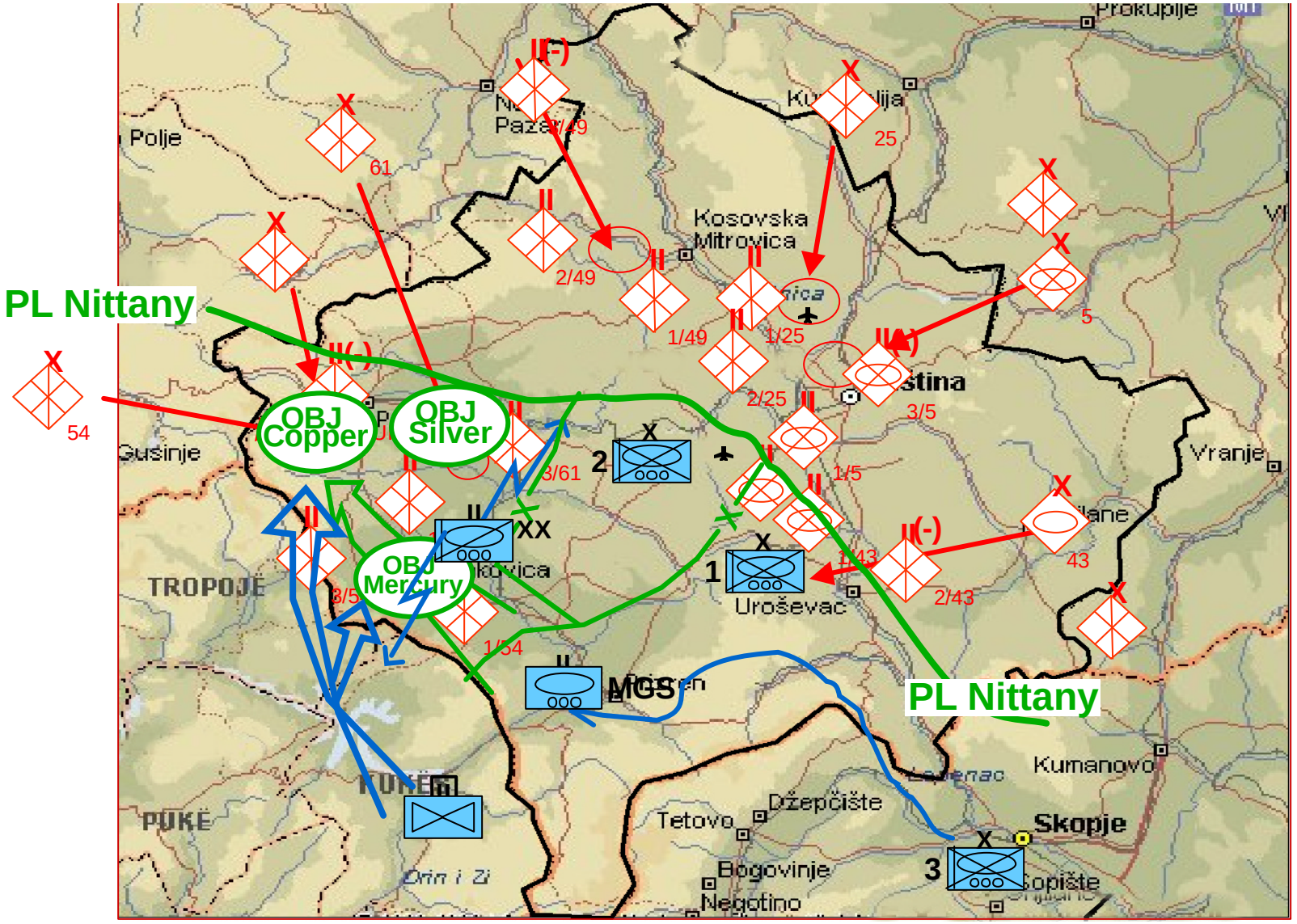
Phase 1A


PL Nittany
Novi Pazar
Polje
Kosovska Mitrovica
Kuršumlij
Peć
Gusinje
TROPOJE
KUKËS
PUKË
Orin i Zi
Tetovo
Džepčište
Bogovinje
Negotino
Kumanovo
Skopje
Vranje
OBJ
PL Nittany
61
2/49
25
1/49
3/61
1/25
5
54
1/61
1/54
2/54
2/61
2/5
1/5
1/43
43
1
XX

Phase 1B


PL Nittany
54
61
49
3/49
2/49
1/49
1/25
25
2/25
3/5
5
2/UI
3/61
1/5
1/43
43
2/43
3/54
1/54
OBJ Lead
OBJ Lum
XX
1
2
MGS
PL Nittany
Prokuplje
Novi Pazar
Kuršumlija
Kosovska Mitrovica
Sitnica
Priština
Peć
Gusinje
Vranje
Gnjilane
TROPOJE
KUKES
PUKË
Tetovo
Džepčište
Kumanovo
Skopje
Bogovinje
Negotino
Sopište

Phase 1C


PL Nittany
OBJ Copper
OBJ Silver
OBJ Mercury
PL Nittany
MG5
Kosovska Mitrovica
Uroševac
Skopje
Kumanovo
Tetovo
Džepčište
Bogovinje
Negotino
Vranje
Gusinje
TROPOJE
PUKË
Polje
Prokuplje
54
61
2/49
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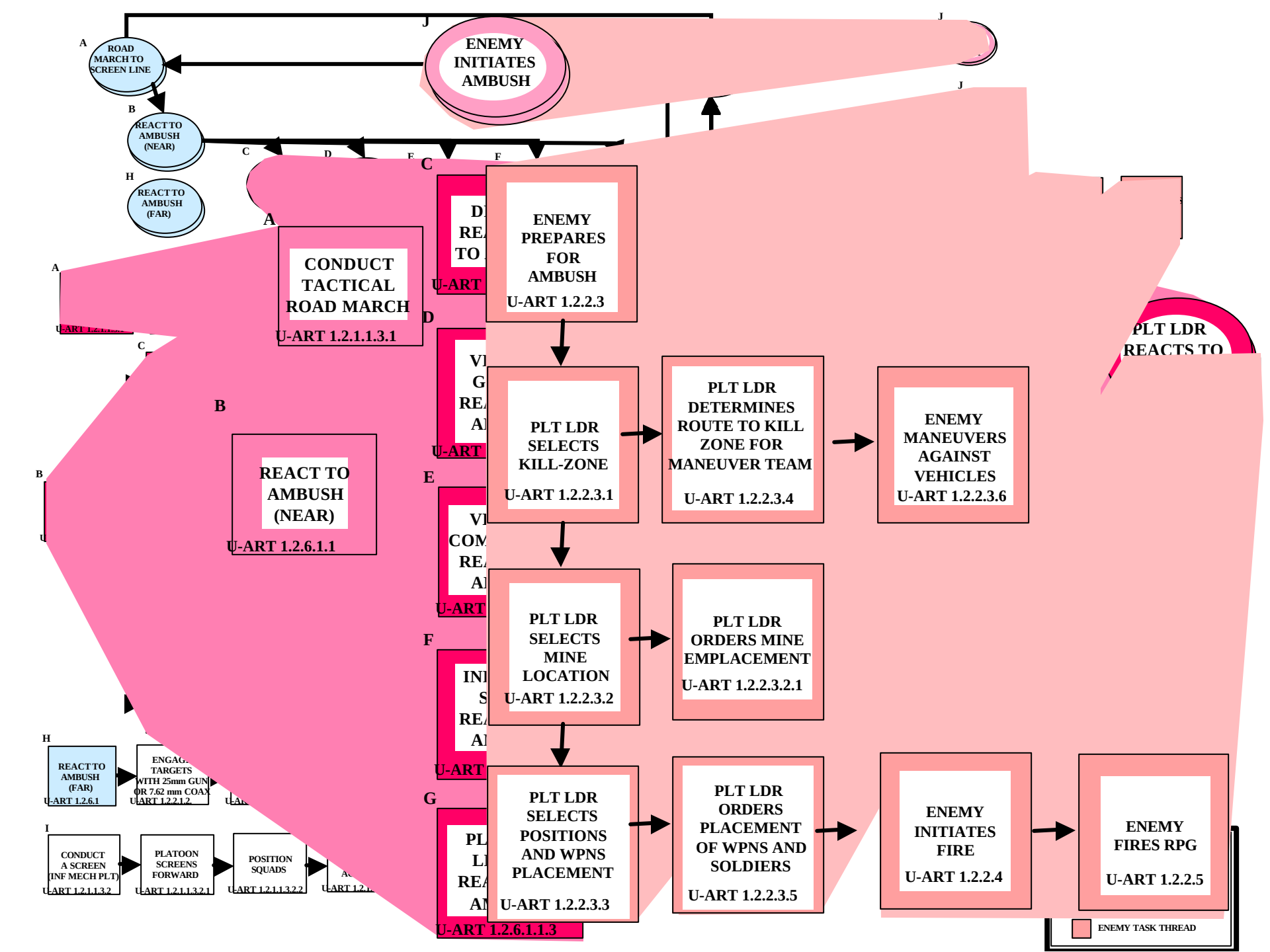
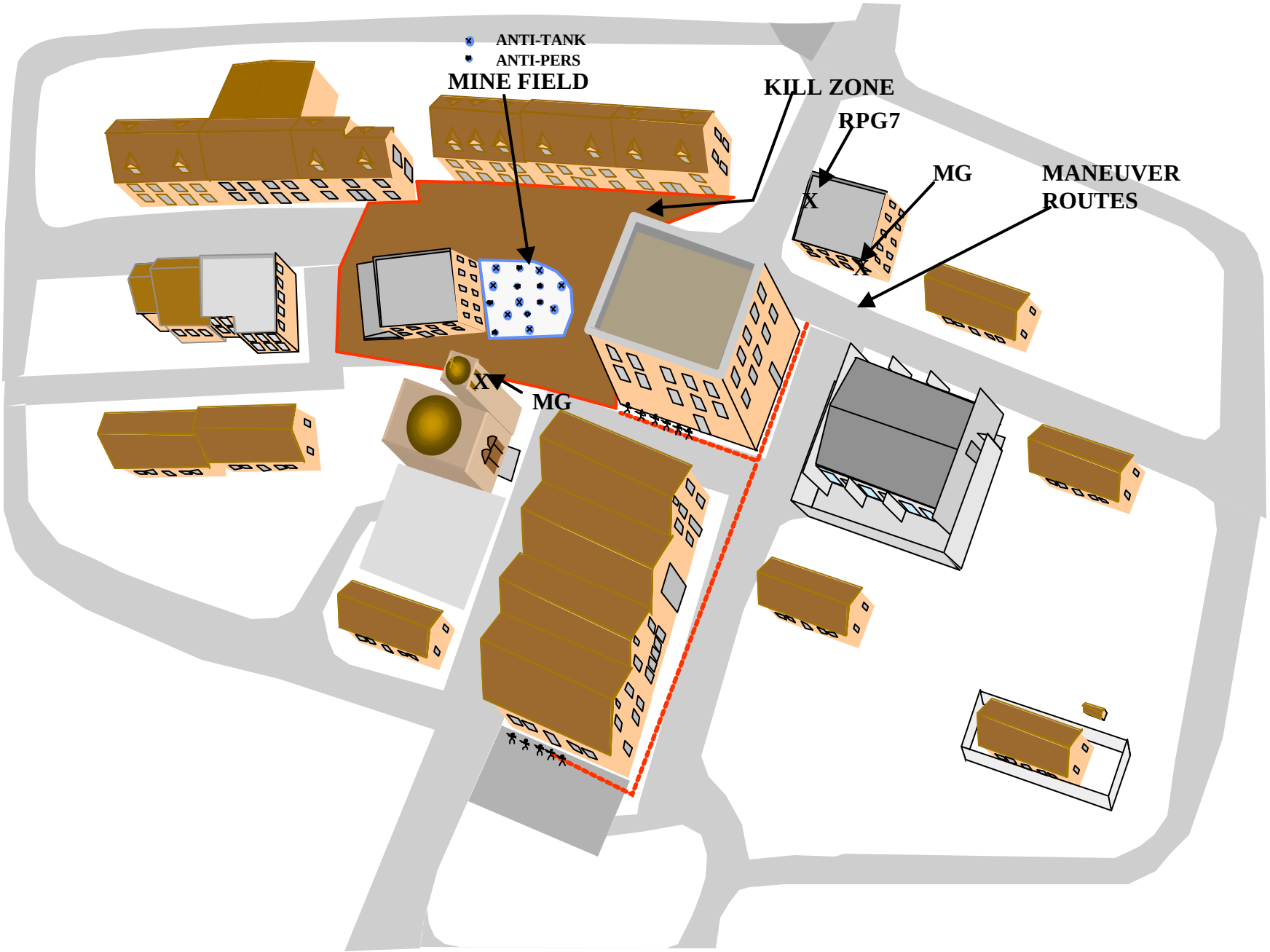
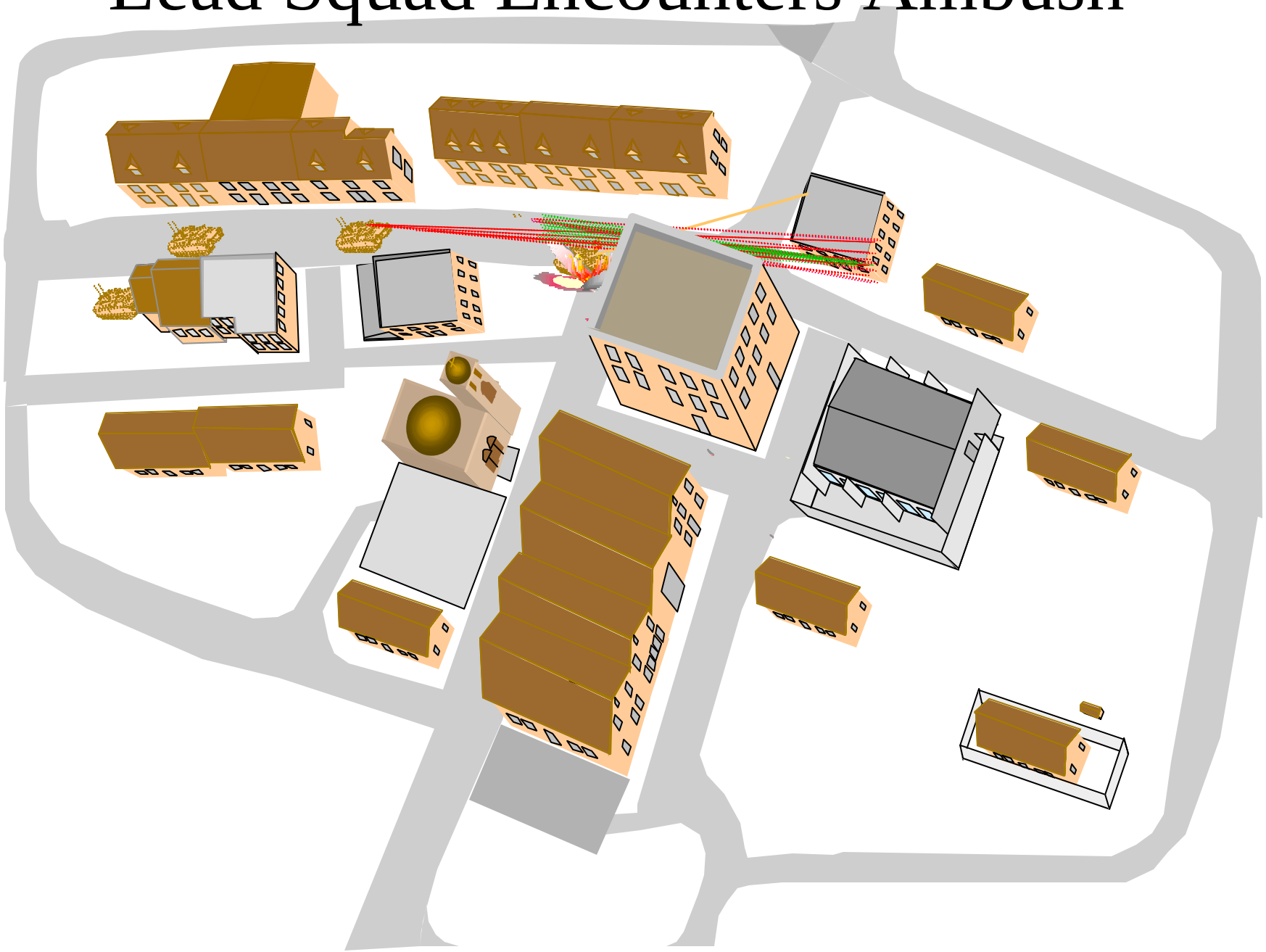
3/5
2/25
1/5
3/61
1/54
1/43
2/43
43

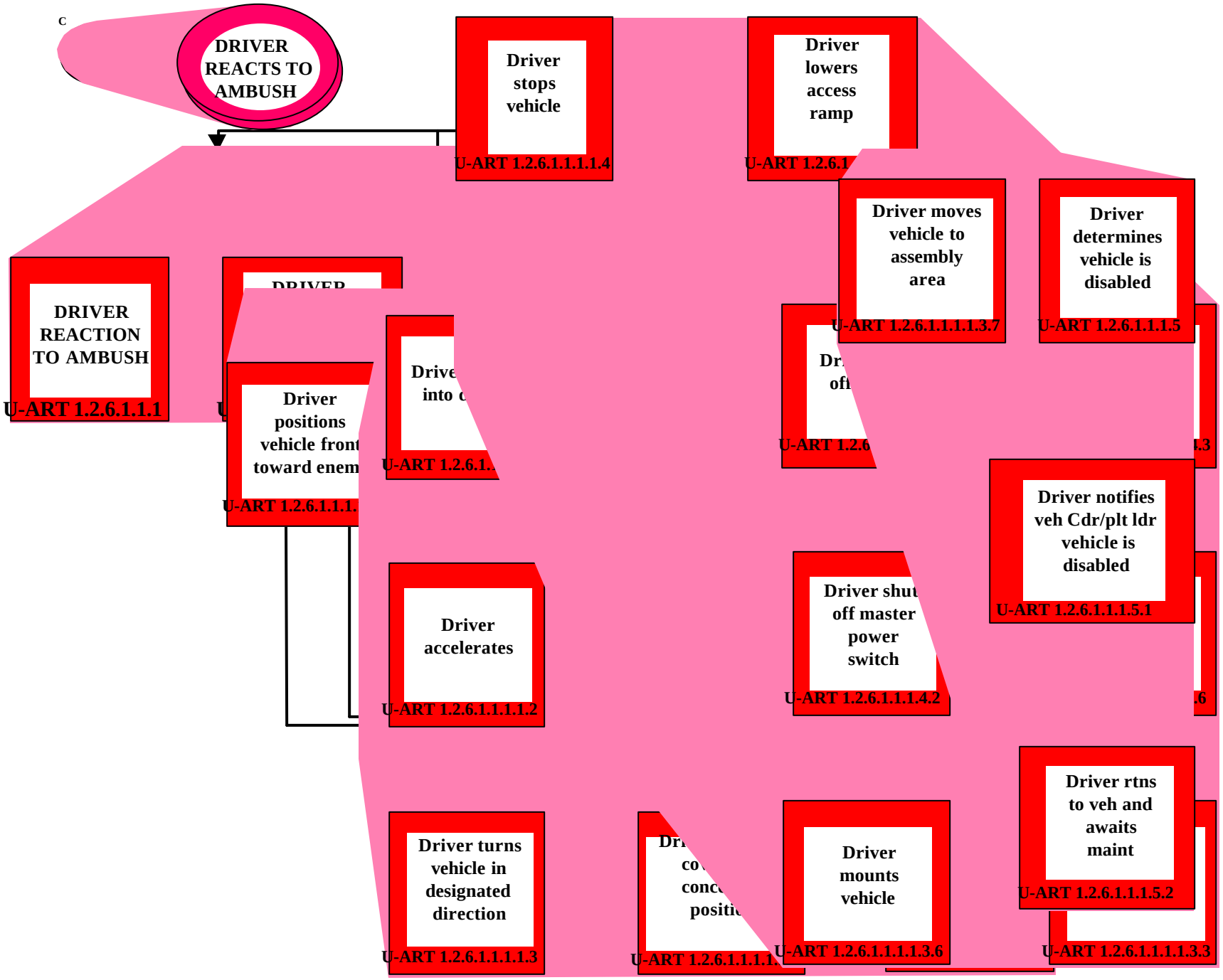

A
ROAD MARCH TO SCREEN LINE
B
REACT TO AMBUSH (NEAR)
H
REACT TO AMBUSH (FAR)
J
ENEMY INITIATES AMBUSH
C
ENEMY PREPARES FOR AMBUSH
U-ART 1.2.2.3
A
CONDUCT TACTICAL ROAD MARCH
U-ART 1.2.1.1.3.1
B
REACT TO AMBUSH (NEAR)
U-ART 1.2.6.1.1
PLT LDR SELECTS KILL-ZONE
U-ART 1.2.2.3.1
PLT LDR DETERMINES ROUTE TO KILL ZONE FOR MANEUVER TEAM
U-ART 1.2.2.3.4
ENEMY MANEUVERS AGAINST VEHICLES
U-ART 1.2.2.3.6
PLT LDR SELECTS MINE LOCATION
U-ART 1.2.2.3.2
PLT LDR ORDERS MINE EMPLACEMENT
U-ART 1.2.2.3.2.1
PLT LDR SELECTS POSITIONS AND WPNS PLACEMENT
U-ART 1.2.2.3.3
PLT LDR ORDERS PLACEMENT OF WPNS AND SOLDIERS
U-ART 1.2.2.3.5
ENEMY INITIATES FIRE
U-ART 1.2.2.4
ENEMY FIRES RPG
U-ART 1.2.2.5
REACT TO AMBUSH (FAR)
U-ART 1.2.6.1
CONDUCT A SCREEN (INF MECH PLT)
U-ART 1.2.1.1.3.2
PLATOON SCREENS FORWARD
U-ART 1.2.1.1.3.2.1
POSITION SQUADS
U-ART 1.2.1.1.3.2.2
ENEMY TASK THREAD

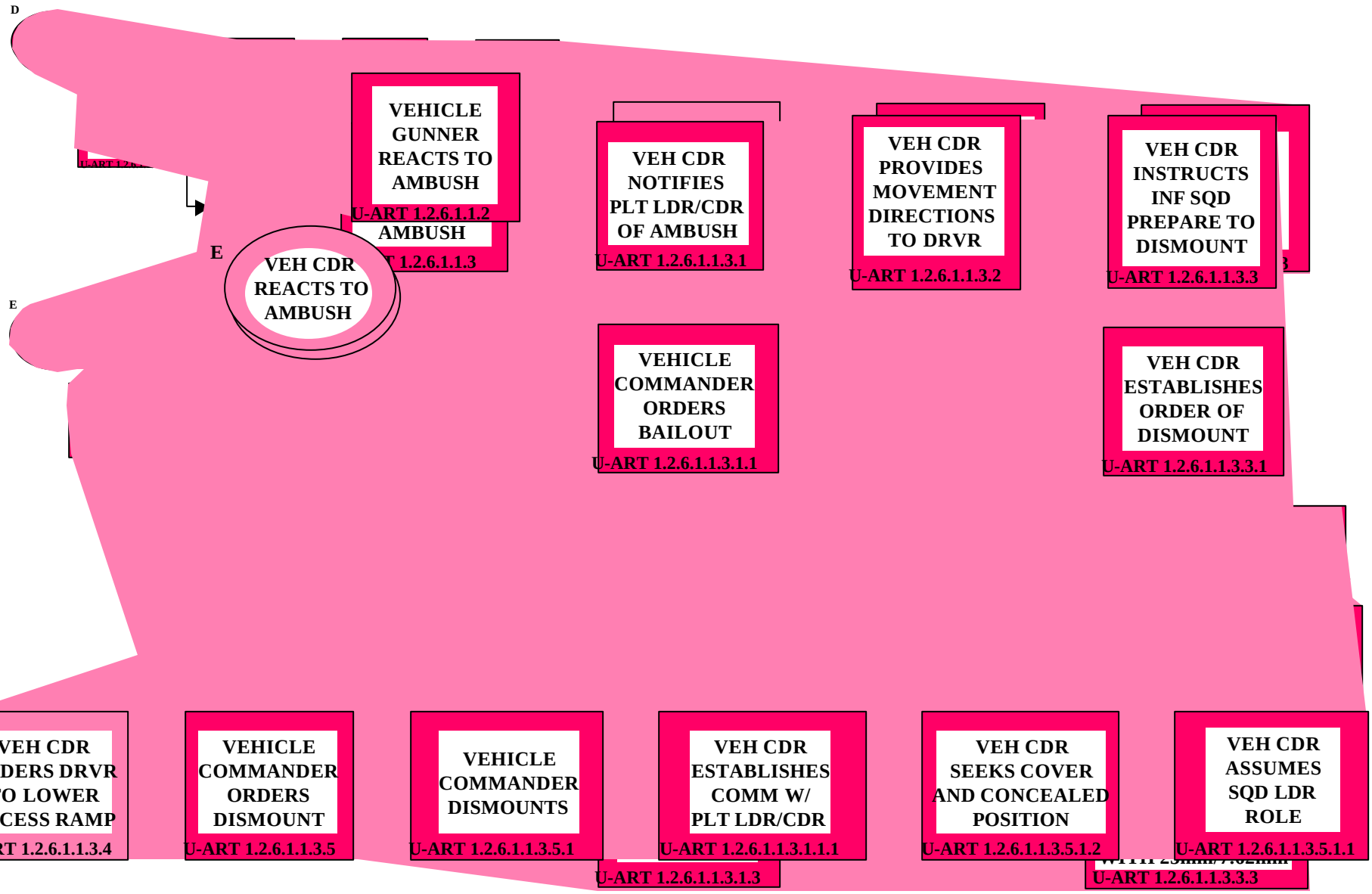
OPFOR Ambush Site Plan

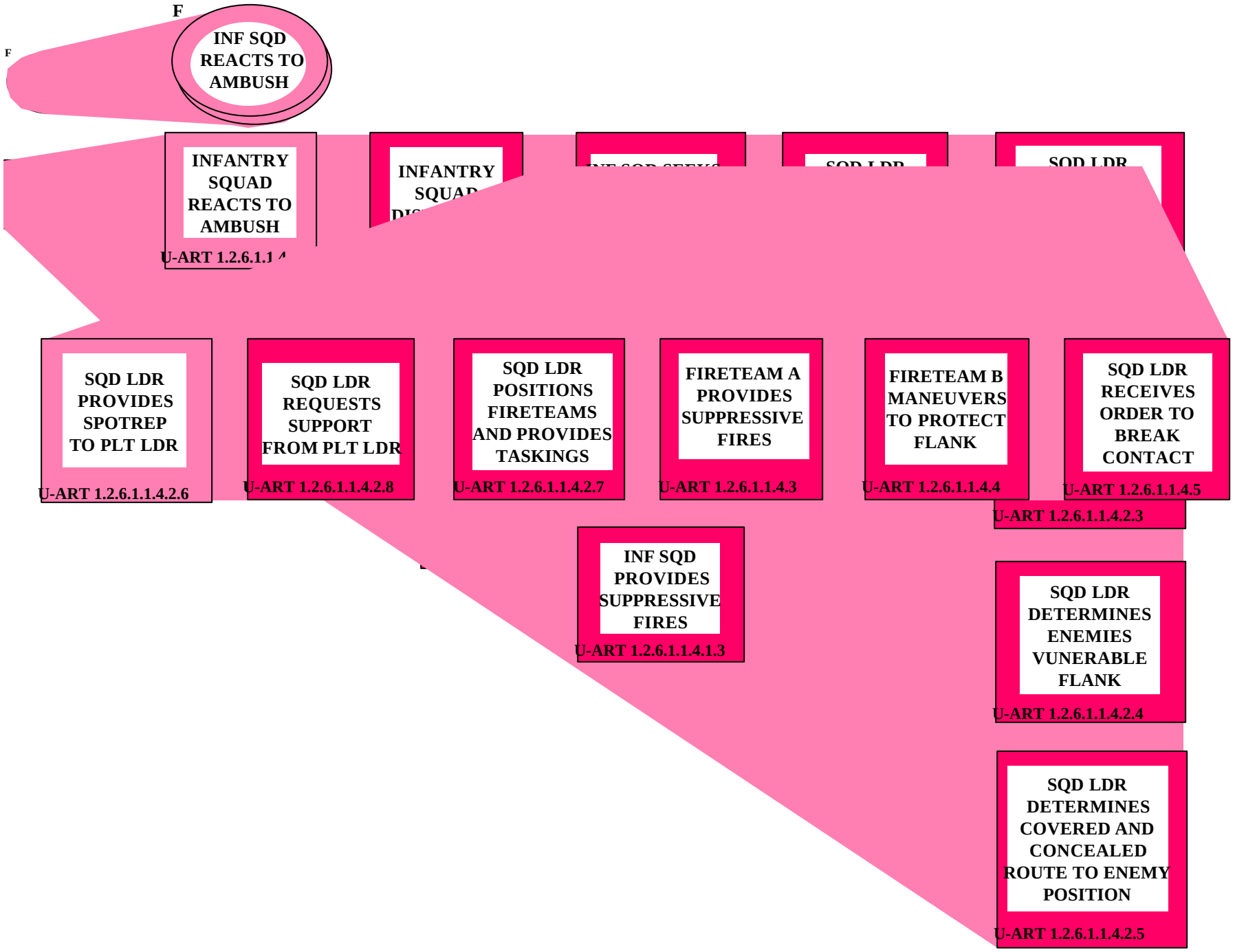


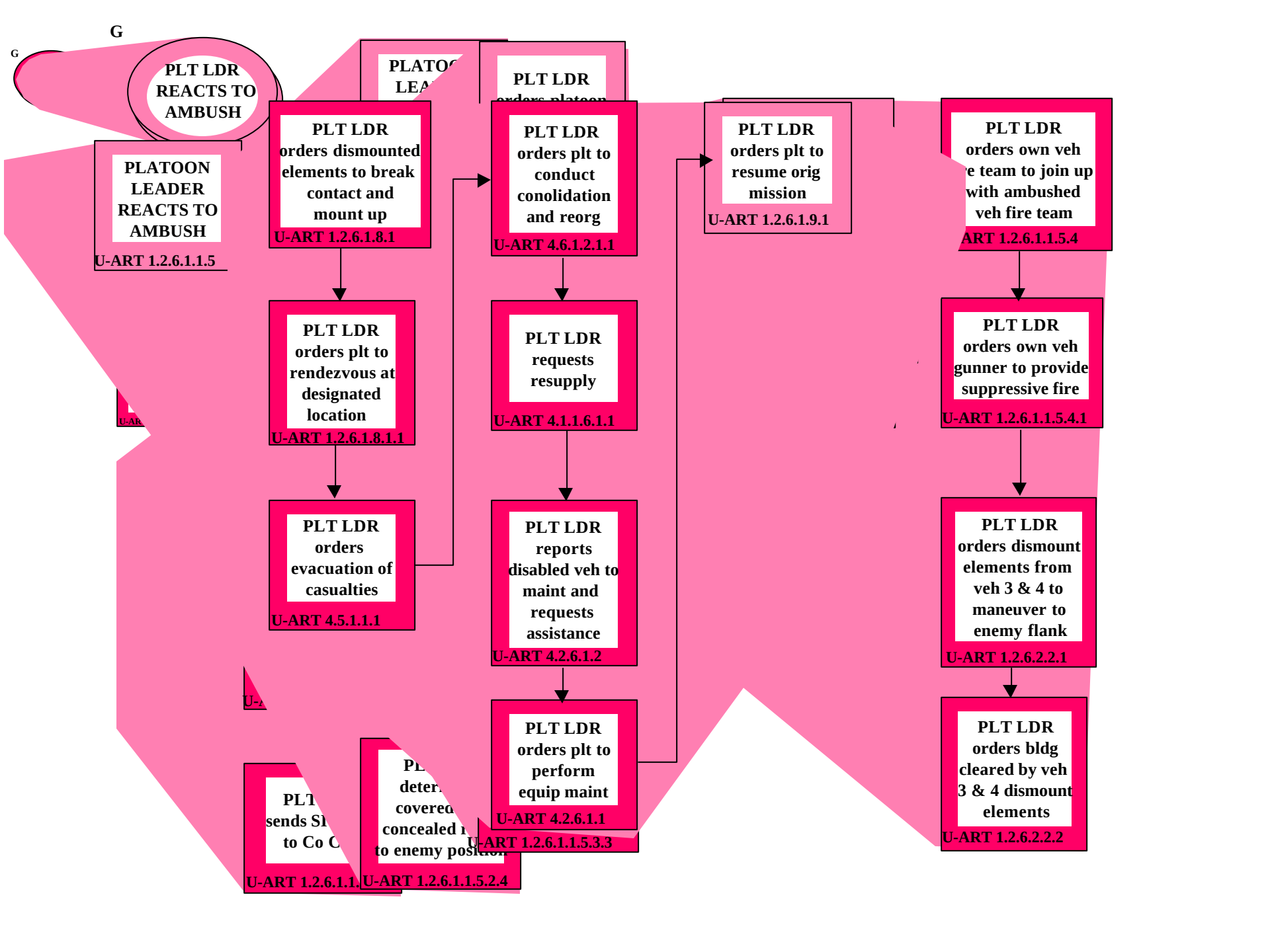
Lead Squad Encounters Ambush

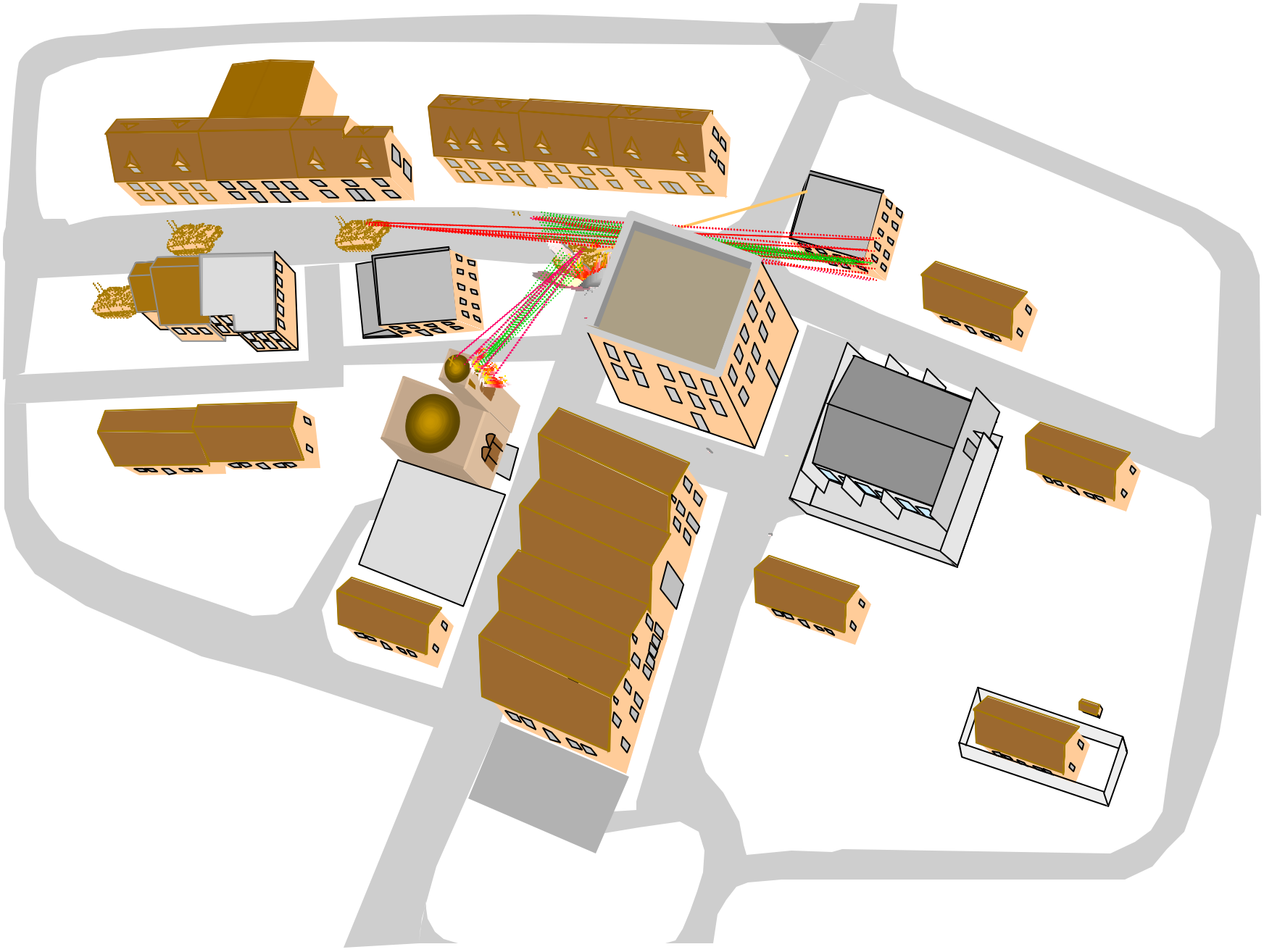


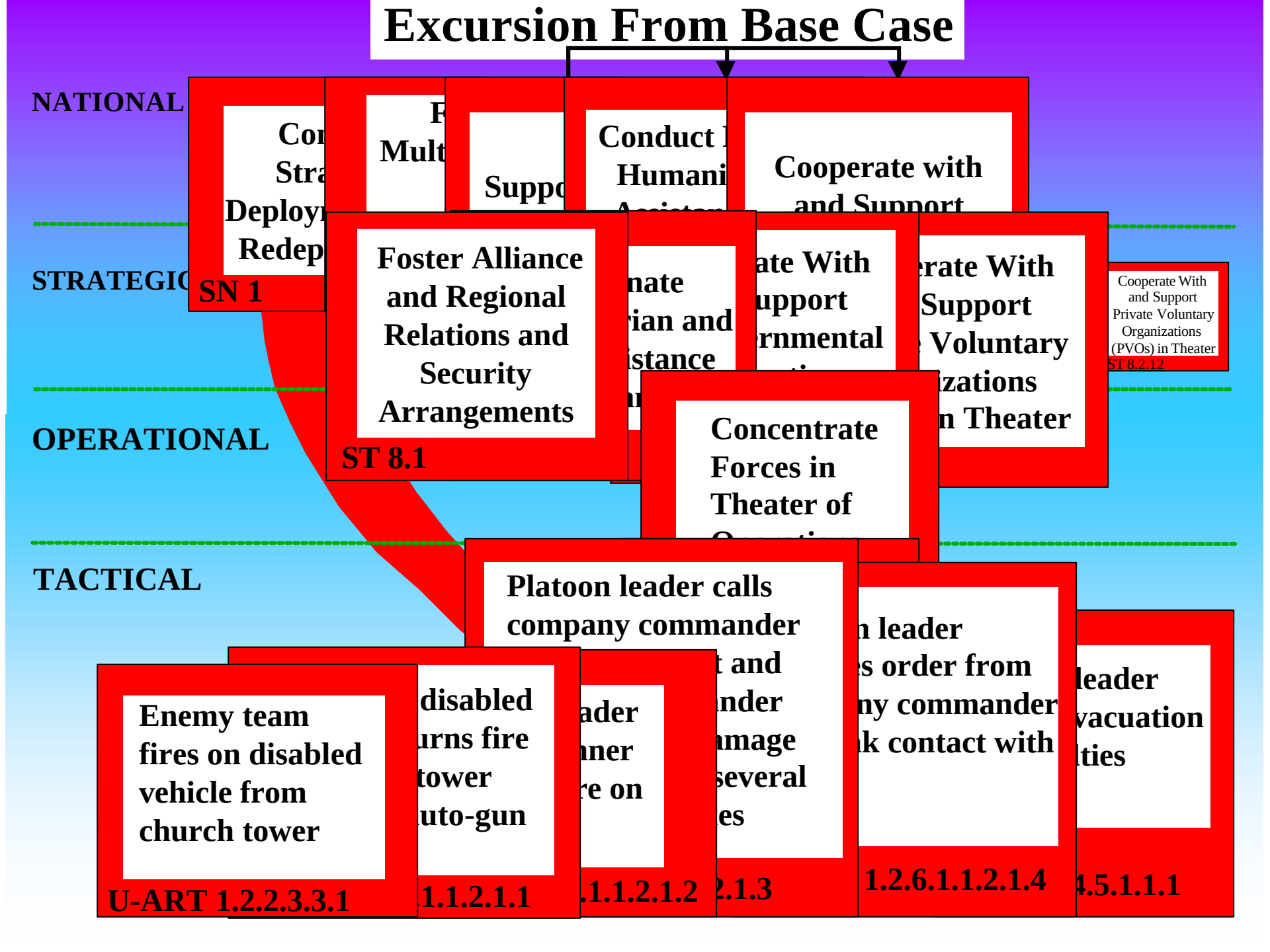

C
DRIVER REACTS TO AMBUSH
Driver stops vehicle
U-ART 1.2.6.1.1.1.1.4
Driver lowers access ramp
U-ART 1.2.6.1
DRIVER REACTION TO AMBUSH
U-ART 1.2.6.1.1.1
Driver moves vehicle to assembly area
U-ART 1.2.6.1.1.1.1.3.7
Driver determines vehicle is disabled
U-ART 1.2.6.1.1.1.5
Driver positions vehicle front toward enem
U-ART 1.2.6.1.1.1.
U-ART 1.2.6.1.
U-ART 1.2.6
Driver notifies veh Cdr/plt ldr vehicle is disabled
U-ART 1.2.6.1.1.1.5.1
Driver accelerates
U-ART 1.2.6.1.1.1.1.2
Driver shut off master power switch
U-ART 1.2.6.1.1.1.4.2
Driver rtns to veh and awaits maint
U-ART 1.2.6.1.1.1.5.2
Driver turns vehicle in designated direction
U-ART 1.2.6.1.1.1.1.3
Driver mounts vehicle
U-ART 1.2.6.1.1.1.1.3.6
U-ART 1.2.6.1.1.1.1.3.3


D
VEHICLE GUNNER REACTS TO AMBUSH
U-ART 1.2.6.1.1.2
AMBUSH
T 1.2.6.1.1.3
VEH CDR NOTIFIES PLT LDR/CDR OF AMBUSH
U-ART 1.2.6.1.1.3.1
VEH CDR PROVIDES MOVEMENT DIRECTIONS TO DRVR
U-ART 1.2.6.1.1.3.2
VEH CDR INSTRUCTS INF SQD PREPARE TO DISMOUNT
U-ART 1.2.6.1.1.3.3
E
VEH CDR REACTS TO AMBUSH
E
VEHICLE COMMANDER ORDERS BAILOUT
U-ART 1.2.6.1.1.3.1.1
VEH CDR ESTABLISHES ORDER OF DISMOUNT
U-ART 1.2.6.1.1.3.3.1
VEH CDR ORDERS DRVR TO LOWER ACCESS RAMP
U-ART 1.2.6.1.1.3.4
VEHICLE COMMANDER ORDERS DISMOUNT
U-ART 1.2.6.1.1.3.5
VEHICLE COMMANDER DISMOUNTS
U-ART 1.2.6.1.1.3.5.1
VEH CDR ESTABLISHES COMM W/ PLT LDR/CDR
U-ART 1.2.6.1.1.3.1.1.1
U-ART 1.2.6.1.1.3.1.3
VEH CDR SEEKS COVER AND CONCEALED POSITION
U-ART 1.2.6.1.1.3.5.1.2
VEH CDR ASSUMES SQD LDR ROLE
U-ART 1.2.6.1.1.3.5.1.1
U-ART 1.2.6.1.1.3.3.3


F
F
INF SQD REACTS TO AMBUSH
INFANTRY SQUAD REACTS TO AMBUSH
U-ART 1.2.6.1.1.4
INFANTRY SQUAD
SQD LDR
SQD LDR PROVIDES SPOTREP TO PLT LDR
U-ART 1.2.6.1.1.4.2.6
SQD LDR REQUESTS SUPPORT FROM PLT LDR
U-ART 1.2.6.1.1.4.2.8
SQD LDR POSITIONS FIRETEAMS AND PROVIDES TASKINGS
U-ART 1.2.6.1.1.4.2.7
FIRETEAM A PROVIDES SUPPRESSIVE FIRES
U-ART 1.2.6.1.1.4.3
FIRETEAM B MANEUVERS TO PROTECT FLANK
U-ART 1.2.6.1.1.4.4
SQD LDR RECEIVES ORDER TO BREAK CONTACT
U-ART 1.2.6.1.1.4.5
U-ART 1.2.6.1.1.4.2.3
INF SQD PROVIDES SUPPRESSIVE FIRES
U-ART 1.2.6.1.1.4.1.3
SQD LDR DETERMINES ENEMIES VUNERABLE FLANK
U-ART 1.2.6.1.1.4.2.4
SQD LDR DETERMINES COVERED AND CONCEALED ROUTE TO ENEMY POSITION
U-ART 1.2.6.1.1.4.2.5


G
G
PLT LDR REACTS TO AMBUSH
PLATOON LEADER REACTS TO AMBUSH
U-ART 1.2.6.1.1.5
PLT LDR orders dismounted elements to break contact and mount up
U-ART 1.2.6.1.8.1
PLT LDR orders plt to rendezvous at designated location
U-ART 1.2.6.1.8.1.1
PLT LDR orders evacuation of casualties
U-ART 4.5.1.1.1
PLT LDR orders plt to conduct conolidation and reorg
U-ART 4.6.1.2.1.1
PLT LDR requests resupply
U-ART 4.1.1.6.1.1
PLT LDR reports disabled veh to maint and requests assistance
U-ART 4.2.6.1.2
PLT LDR orders plt to perform equip maint
U-ART 4.2.6.1.1
U-ART 1.2.6.1.1.5.3.3
PLT LDR orders plt to resume orig mission
U-ART 1.2.6.1.9.1
PLT LDR orders own veh team to join up with ambushed veh fire team
U-ART 1.2.6.1.1.5.4
PLT LDR orders own veh gunner to provide suppressive fire
U-ART 1.2.6.1.1.5.4.1
PLT LDR orders dismount elements from veh 3 & 4 to maneuver to enemy flank
U-ART 1.2.6.2.2.1
PLT LDR orders bldg cleared by veh 3 & 4 dismount elements
U-ART 1.2.6.2.2.2
U-ART 1.2.6.1.1.5.2.4

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.1.1.2.1.2
2.1.3

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X		X	X	X	
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X	X				
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

IFV C4ISR Matrix

Task: Platoon Leader Assesses Situation (U-ART 1.2.6.1.1.5.2)

***Notes*: This is a Primary Thread Task**

Definition:

Platoon leader assesses the enemy position as well as that of his platoon, gathering information upon which to base tactical decisions.

	Con						
Platoon Leader Assesses Situation							
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position							
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	**X**	**X**	**X**				
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	**X**	**X**	**X**				

IFV C4ISR Matrix

	Com						
Platoon Leader Assesses Situation							
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position							
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	**X**	**X**	**X**				

Task: Platoon Leader Determines Enemies Vulnerable Flank (U-ART 1.2.6.1.1.5.2.3)

***Notes*: This is a Primary Thread Task**

Definition:

Platoon leader determines the enemy's most vulnerable flank and makes plans taking advantage of the vulnerability.

IFV C4ISR Matrix

	Com						
Platoon Leader Assesses Situation							
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position							
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	**X**	**X**	**X**				

Task: Platoon Leader Determines Covered and Concealed Route to Enemy Position (U-ART 1.2.6.1.1.5.2.4)

***Notes*: This is a Primary Thread Task**

Definition:

Platoon leader surveys the area and selects a route to the enemy position that offers the best cover and concealment.

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position							
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization							

Task: Plt Ldr Orders Own Veh Driver To Maneuver To Covered Position (U-ART 1.2.6.1.1.5.3.1)

***Notes*: This is a Primary Thread Task**

Definition:

Platoon leader orders own vehicle driver to maneuver the vehicle to a covered position placing the front of the vehicle facing the enemy position.

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position							
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization							

Task: Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization (U-ART 4.6.1.2.1.1)

***Notes*: This is a Primary Thread Task**

Definition:

Platoon leader orders the platoon to conduct consolidation and reorganization of personnel and equipment in preparation for the next operation.

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		**X**	**X**	**X**	**X**	**X**	**X**
Pla… Det… Vul…							**X**
Pla… Det… Cor… Ene…							
Plt … Drv… Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	**X**	**X**	**X**				

- SINCGARS ASIP RADIOS WITH SIP/INC
- ENHANCED POSITION LOCATION REPORTING SYSTEM (EPLRS)
- INTEGRATED COMBAT COMMAND AND CONTROL VIA FBCB2 SOFTWARE RUNNING IN AN APPLIQUE+ CPU
- VEHICULAR INTERCOMMUNICATIONS SYSTEMS (VIS)
- COMMANDER'S TACTICAL DISPLAY WITH MAPS/GRAPHICS
- SQUAD TACTICAL DISPLAY/FLIR MONITOR

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		**X**	**X**	**X**	**X**	**X**	**X**
Platoon Leader Determ Vulner							**X**
Platoo Determ Conce Enemy							
Plt Ld Drvr T Cover							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	**X**	**X**	**X**				

- SINCGARS ASIP RADIOS WITH SIP/INC
- ENHANCED POSITION LOCATION REPORTING SYSTEM (EPLRS)
- POS/NAV WITH INERTIAL GPS (PLGR) SYSTEMS
- VEHICULAR INTERCOMMUNICATIONS SYSTEMS (VIS)
- INTEGRATED COMBAT COMMAND AND CONTROL VIA FBCB2 SOFTWARE RUNNING IN AN APPLIQUE+ CPU
- COMMANDER'S TACTICAL DISPLAY WITH MAPS/GRAPHICS
- SQUAD TACTICAL DISPLAY/FLIR MONITOR

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		**X**	**X**	**X**	**X**	**X**	**X**
Platoon Leader Determi… Vulneral…							**X**
Platoon … Determi… Conceal… Enemy Position							
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	**X**	**X**	**X**				
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	**X**	**X**	**X**				

- SINCGARS ASIP RADIOS WITH SIP/INC
- ENHANCED POSITION LOCATION REPORTING SYSTEM (EPLRS)
- POS/NAV WITH INERTIAL GPS (PLGR) SYSTEMS
- VEHICULAR INTERCOMMUNICATIONS SYSTEMS (VIS)

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enem Vulnerable Flank							
Platoon Leader Determines Cove Concealed Route Enemy Position							
Plt Ldr Orders O Drvr To Maneuve Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

- POS/NAV WITH INERTIAL GPS (PLGR) SYSTEMS
- INTEGRATED COMBAT COMMAND AND CONTROL VIA FBCB2 SOFTWARE RUNNING IN AN APPLIQUE+ CPU
- COMMANDER'S TACTICAL DISPLAY WITH MAPS/GRAPHICS
- SQUAD TACTICAL DISPLAY/FLIR MONITOR
- MASS STORAGE PROVIDED IN THE APPLIQUE+ CPU

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable			X	X	X		X
Platoon Lea Determines Concealed R Enemy Posit							
Plt Ldr Ord Drvr To Ma Covered Pos							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

- ENHANCED POSITION LOCATION REPORTING SYSTEM (EPLRS)
- POS/NAV WITH INERTIAL GPS (PLGR) SYSTEMS
- INTEGRATED COMBAT COMMAND AND CONTROL VIA FBCB2 SOFTWARE RUNNING IN AN APPLIQUE+ CPU
- COMMANDER'S TACTICAL DISPLAY WITH MAPS/GRAPHICS
- SQUAD TACTICAL DISPLAY/FLIR MONITOR
- MASS STORAGE PROVIDED IN THE APPLIQUE+ CPU

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Lea Determines Concealed Enemy Pos							
Plt Ldr Orc Drvr To Ma Covered Po							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

- COMMANDER'S INDEPENDENT VIEWER (CIV) : 360 TRAVERSE
  --HTI SECOND GENERATION FLIR
  --DAY TV
- ENHANCED POSITION LOCATION REPORTING SYSTEM (EPLRS)
- COMMANDER'S TACTICAL DISPLAY WITH MAPS/GRAPHICS
- SQUAD TACTICAL DISPLAY/FLIR MONITOR

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Lea Determines Concealed Enemy Pos							
Plt Ldr Orc Drvr To Ma Covered Po							
Plt Ldr Orc Conduct Co and Reorga							

- COMMANDER'S INDEPENDENT VIEWER (CIV) : 360 TRAVERSE
  --HTI SECOND GENERATION FLIR
  --DAY TV
- SINCGARS ASIP RADIOS WITH SIP/INC
- ENHANCED POSITION LOCATION REPORTING SYSTEM (EPLRS)
- POS/NAV WITH INERTIAL GPS (PLGR) SYSTEMS
- COMMANDER'S TACTICAL DISPLAY WITH MAPS/GRAPHICS
- SQUAD TACTICAL DISPLAY/FLIR MONITOR
- MASS STORAGE PROVIDED IN THE APPLIQUE+ CPU

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Lea… Determines… Vulnerable…							X
Platoon Lea… Determines… Concealed … Enemy Pos…						X	
Plt Ldr Ord… Drvr To Maneuver To Covered Position	X	X	X				
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Access of system info to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							X
Platoon Leader Determines Covered a Concealed Route to Enemy Position							
Plt Ldr Orders Own V Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Connectivity, reliability, and data rates of proposed comm links

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							X
Platoon Leader Determines Covered a Concealed Route to Enemy Position							
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X	X				
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Network integrity and information assurance

Global C4ISR Infrastructure: Access of system information to all nodes

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							X
Platoon Leader Determines Covered a Concealed Route to Enemy Position							
Plt Ldr Orders Own V Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoo Conduct Consolidation and Reorganization							

Global C4ISR Infrastructure: Network integrity and information assurance

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

Survivable: Time between the appearance of a threat effect within the FCS region of occupation and initiation of response

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							X
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X		X	X	X	
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X	X				
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							X
Platoon Leader Determines Covered a Concealed Route to Enemy Position							
Plt Ldr Orders Own V Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

Survivable: Time between the appearance of a threat effect within the FCS region of occupation and initiation of response

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X		X	X	X	
Plt Ldr Orders Own Vel Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon Conduct Consolidation and Reorganization							

Global C4ISR Infrastructure: Connectivity, reliability, and data rates of proposed comm links

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Leader Determines Covered a Concealed Route to Enemy Position							
Plt Ldr Orders Own V Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Network integrity and information assurance

Global C4ISR Infrastructure: Access of system information to all nodes

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Leader Determines Covered a Concealed Route to Enemy Position							
Plt Ldr Orders Own V Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoo Conduct Consolidation and Reorganization							

Global C4ISR Infrastructure: Network integrity and information assurance

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

Survivable: Time between the appearance of a threat effect within the FCS region of occupation and initiation of response

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Leader Determines Covered a Concealed Route to Enemy Position							
Plt Ldr Orders Own V Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoo Conduct Consolidation and Reorganization							

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

Survivable: Time between the appearance of a threat effect within the FCS region of occupation and initiation of response

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X					
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X					
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X					
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X					

Global C4ISR Infrastructure: Network integrity and information assurance

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

Versatile: Time to accomplish mission planning and reconfiguration (as needed)

Lethal: Effectiveness of C4ISR in supporting engagement planning and execution

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
				X	X	X	X
				X	X		X
				X	X	X	
Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Network integrity and information assurance

Global C4ISR Infrastructure: Access of system information to all nodes

Versatile: Time to accomplish mission planning and reconfiguration (as needed)

Lethal: Effectiveness of C4ISR in supporting engagement planning and execution

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Pla De Vu					X		X
Pla De Co En					X	X	
Plt Dr Co							
Plt Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Network integrity and information assurance

Global C4ISR Infrastructure: Access of system information to all nodes

Versatile: time to accomplish mission planning and reconfiguration (as needed)

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X		X	X	X	
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position							
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X					
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X					
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X					

Deployable: Accuracy and timeliness of situation awareness throughout deployment process

Agile: Time to understand the changing situation

Lethal: Effectiveness of C4ISR in achieving mobility of the force

Survivable: Quality of pairing countermeasures and threat effects within the FCS region of occupation

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X					
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X					
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Deployable: Accuracy and timeliness of situation awareness throughout deployment process

Lethal: Time between the appearance of a threat within the FCS region of interest and initiation of engagement

Lethal: Effectiveness of C4ISR in achieving mobility of the force

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X				
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X					
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X	X				
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Connectivity, reliability, and data rates of proposed comm links

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to acquire an early view of the situation

Agile: Time to understand the changing situation

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank							
Platoon Leader Determines Covered and Concealed Route to Enemy Position							
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X						
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X						

Global C4ISR Infrastructure: Connectivity, reliability, and data rates of proposed comm links

Responsive: Time to develop alternate mission plan and configure package for re-deployment

Deployable:Accuracy and timeliness of situation awareness throughout deployment process

Deployable: Time to achieve full C4ISR operational capability once in the mission area

Agile: Time to understand the changing situation

Versatile: Time to accomplish mission planning and reconfiguration (as needed)

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X	X	X	X	X
Platoon Leader Determines Enemies Vulnerable Flank			X	X	X		X
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X					
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X					
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X					

Responsive: Time to develop alternate mission plan and configure package for re-deployment

Deployable: Accuracy and timeliness of situation awareness throughout deployment process

Agile: Time to understand the changing situation

Versatile: Time to accomplish mission planning and reconfiguration (as needed)

IFV C4ISR Matrix

	Command	Control	Communications	Computers	Intelligence	Surveillance	Recon
Platoon Leader Assesses Situation		X	X				
Platoon Leader Determines Enemies Vulnerable Flank			X				
Platoon Leader Determines Covered and Concealed Route to Enemy Position		X					
Plt Ldr Orders Own Veh Drvr To Maneuver To Covered Position	X	X	X				
Plt Ldr Orders Platoon to Conduct Consolidation and Reorganization	X	X	X				

Global C4ISR Infrastructure: Connectivity, reliability, and data rates of proposed comm links

Global C4ISR Infrastructure: Access of system information to all nodes

Responsive: Time to develop alternate mission plan and configure package for re-deployment

Agile: Time to reconfigure the C4ISR package

Lethal: Time to provide decision maker with accurate target damage assessment

System-of-Systems